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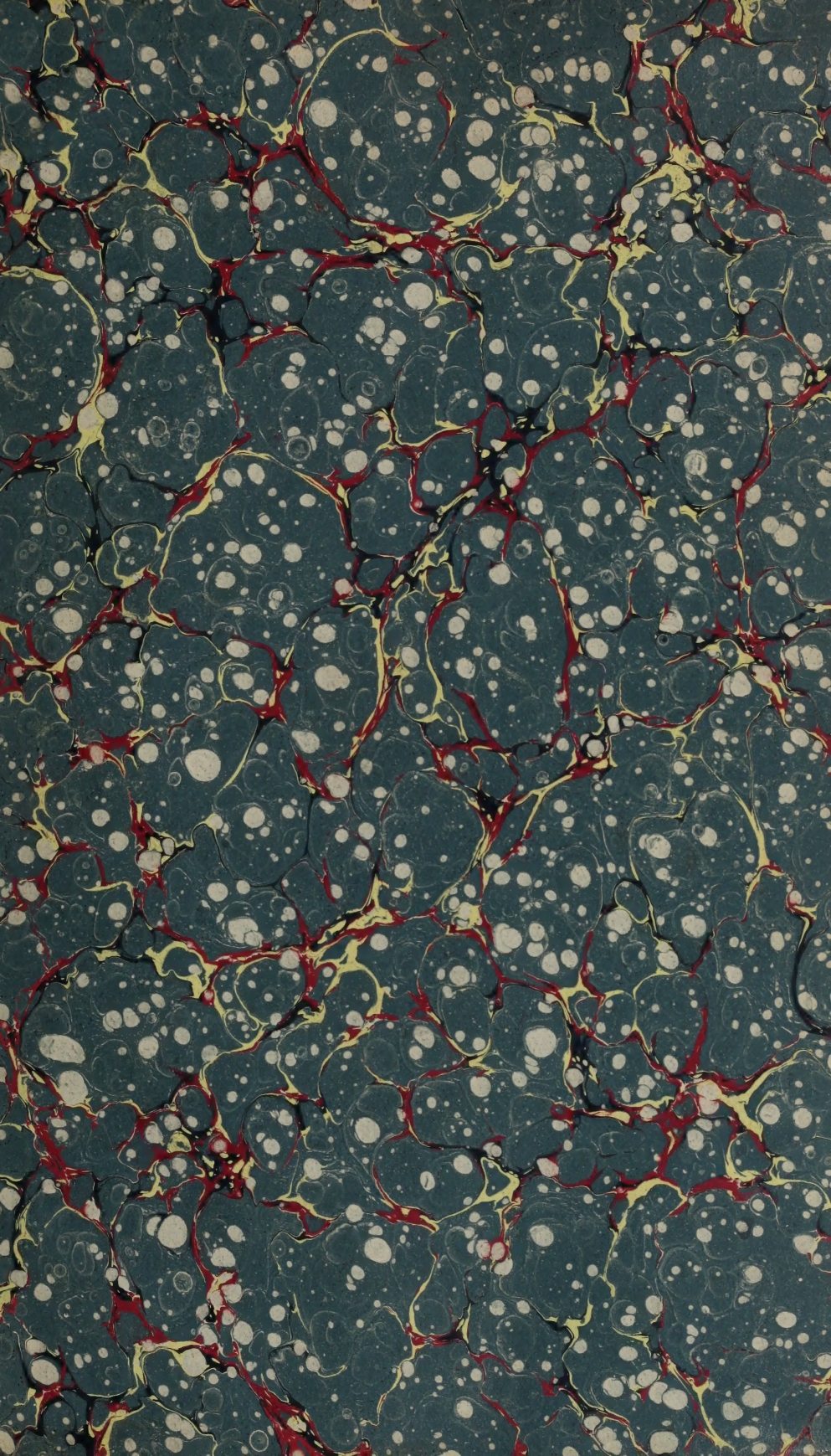



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ANTHONY'S

Photograph. Gulletin.

VOLUME XX.

1889. .

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., Editor.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., Associate Editor.

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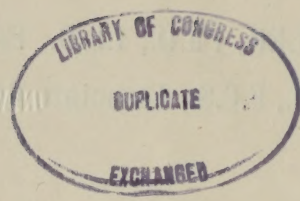
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Photography Collection

VOLUME 1

1830



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THE MOON.

ON ANTHONYS'
ARISTOTYPE PAPER.

First photograph through the great Lick Telescope, at San Jose, Cal., by

PROF. S. W. BURNHAM.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor*.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

JANUARY 12, 1889.

Vol. XX.—No. 1.

HALF A CENTURY—1839-1889.

As the years roll by, and we stop a moment to take note of the achievements of science, we can with difficulty only realize the gigantic strides made by photography. There are but few advances in the realms of science that can compare with it in the rapidity of their development. Steam and electricity have been cited as marking the era covered by the last fifty years, and these are sometimes coupled with photography, as the three signal achievements of the last half century. From the early efforts of Daguerre and Niepce, which gave us the daguerreotype in 1839, to the researches of Abney, Vogel and Eder of to-day, what a rapidly moving army of workers have marched in the line of its progress! To give us the marvelous results of modern photographic achievements, each one of these laborers has had to do his particular share of the work of progress; each one has had to give his mite to build up the colossal structure that to-day commands our admiration, and whose towers and pinnacles are not yet reared, except it may be in a few places. There still remains enough work for thousands of active minds, thousands of acute experimentalists, to push the work to completion, or at least to build up the grand edifice so nobly begun and carried to its present state of perfection. Then let us each and all continue this good work; let us each and all add our share to the advancement of the art we love, the science we so much admire, remembering, with the American poet:

“Not enjoyment, and not sorrow,
Is our destined end or way;
But to act, that each to-morrow
Finds us farther than to-day.”

Finds us farther on the road to the full development of the wonderful art whose future we cannot now even faintly realize.

Seeing that this year marks a half century's progress in photographic achievements, and that a retrospect of the advances made would serve to guide all workers as to future lines of development, we think a Jubilee Convention of the photographers of America would lead to some useful and practical results. Some talk about such a convention arose at the Minneapolis meeting of the Photographers' Association of America, and it

appeared to be the spirit of many there present that such a Jubilee Convention at Boston this year would be highly appreciated and well received by all the photographers of America. In order to make such a Convention a success, it is necessary that work in that direction should be begun at once, and organized efforts be started in all quarters to make the meeting well worthy of the event it is to commemorate—the first half century's progress of our art.

We sincerely hope that the new officers of the Photographers' Association of America will organize for this purpose at once, and we doubt not that the lovers of our art in Boston will do all they can to further the movement.

One of the best things to do is to organize a number of committees, having definite lines of work to attend to, so that all the labor does not fall upon one or two men, as is so often the case. It appears to us that we may copy our English cousins in this matter, not because "It's English, you know," but for the reason that it gives a better assurance of success, and greater comfort to all concerned. A good "Local Committee" of Boston men is a desideratum, and we could name several gentlemen that can organize such a committee. Such a local committee should be subdivided into a Reception Committee, whose business it should be to look after and assist the general officers of the association to secure quarters and arrange for the meetings; an Excursion Committee, having in view the entertainment of visitors by planning several interesting excursions, many beautiful and interesting places being easily reached from Boston at small expense; and last but not least, an Exhibition Committee, whose special business it shall be to arrange for a display of all the historically interesting objects that mark the progress of photography in America. This last sub-committee is an important one, and its work would be most highly appreciated by all true lovers of photography.

This is somewhat on the plan of the arrangements of the Committee of the British Convention at Birmingham, and we should be glad to see something of this kind carried out. Hitherto all the work has fallen upon a few good-natured members of the association, and they have not always been thanked for their labors. Let us have a royal good time in Boston—such a time as photographers can have if they choose—full of the sunshine of good feeling, full of a fraternal spirit, and with but one object in view—the progress of the art we love. The BULLETIN will be ever ready to lend its aid to such an end.

EDITORIAL NOTES.

WE must apologize to our readers for the lateness of the last issue of the BULLETIN. The delay was caused by the difficulty of getting ready the portrait of the late Mr. Edward Anthony, and the large number necessary for the completion of the edition.

WE copy the following from the *Photographische Mittheilungen*: At the meeting of the "Verein zur Forderung der Photographie," in Berlin, the chairman submitted samples and pictures of the new Anthony paper, which were greatly admired and praised. It is twice as sensitive as that of Dr. Jost and of Stolze, possesses only a thin gelatine coating, in consequence whereof it can be easily washed and fixed. The pictures made on it, which have been copied by lamp-light, are excellent, and it is the general belief that this paper will displace albumen paper, which has been used exclusively for prints for a great many

years. Of particular importance is use of this paper with lamplight, as copying, rendered otherwise so difficult on dark winter days, can be continued without interruption, while an ordinary print on albumen paper could sometimes hardly be completed on a dark day.

PROFESSOR W. H. PICKERING, of the Harvard Observatory, has recently been using photography for the detection of nebulae. The neighborhood of Orion has been mostly used for these researches. From a consideration of the results of this work the Professor believes that four or five thousand new nebulae are discoverable by this means.

WE are indebted to Mr. J. Albert Cole, of the Washington Camera Club, for a copy of the Constitution and By-Laws of the society. The officers are: Edgar Richards, *President*; S. H. Griffith, M.D., *Secretary-Treasurer*; J. Albert Cole, *Corresponding Secretary*. It has a good list of members and is doing some very useful work.

MR. F. H. LATIMER, of Michigan, sends us an excellent method of clearing blue prints, and writes as follows: "I have often been unable to get a good blue color in making blue prints, generally, I believe, owing to poor quality of ammonio-citrate of iron supplied, and have recently found a method, new, at least, to me, of changing the dirty greenish-blue obtained into a fine blue color. After the prints had been washed in the usual manner, immerse them in a solution of oxalic acid. I have been using about 1 in 30. When the color is satisfactory—generally in from three to six minutes—the prints should be again washed in water." The prints sent treated by this method, and a strip of paper showing on half its surface the application of the solution, fully bear out the claim made for this method of treatment. We can recommend it to our readers.

THE New York Camera Club held its first public meeting on Saturday evening, January 5th, in the hall of the Academy of Medicine, 31st street, New York City. The night was a particularly disagreeable one, yet about seventy people, many of them ladies, were present to listen to interesting papers by Mr. Henry J. Newton and Dr. H. G. Piffard, and which we hope to be able to present to our readers at an early date. The club has limited its membership to fifty, and there are now forty-three names upon its roll. It is organized to make photographic investigations and bids fair to do some good work in this direction.

At the second annual meeting of the Montreal Amateur Photographic Club, held in their rooms Saturday, 8th inst., the following were elected to office for the ensuing year: *President*, J. G. Shaw, re-elected; *Vice-President*, J. S. Hall, Jr., M.R.P., re-elected; *Treasurer*, E. Bradshaw; *Secretary*, J. W. Davis, re-elected; *Committee*, Dr. R. Campbell and W. H. Scott.

WE are indebted to the Committee of the Pacific Coast Amateur Photographic Association for their kind invitation to the exhibition, December 10th and 11th. We must also congratulate the club upon the artistic little card, "The Critics," accompanying the invitation. This kind of work elevates photography. It is a handsome little photogravure from a negative by Mr. W. H. Lowden, of San Francisco, representing a row of boys sitting on a board fence

making fun of the photographer. The whole idea is very pleasing, and one of those bits of life that makes us feel :

"One touch of Nature makes the whole world kin."

THE Cranford Camera Club, of Cranford, New Jersey, has recently organized with the following officers: *President*, R. M. Fuller; *Treasurer*, J. C. Wagstaff; *Secretary*, William Chamberlain; *Librarian*, H. N. Gallaudet.

THE following resolutions were passed by the Chicago merchants, on hearing of the death of the late Mr. Edward Anthony:

Whereas, It has pleased Divine Providence to call to his final reward Mr. Edward Anthony, of New York; and

Whereas, He has for many years been universally recognized among photographic merchants as the oldest and one of the most prominent and highly esteemed characters connected with that line of trade; and

Whereas, In his unostentatious yet active and honorable business life, his exalted moral character and high sense of justice won for him the very highest degree of respect and confidence of all business and social acquaintances; therefore be it

Resolved, That we, the undersigned photographic merchants and manufacturers of Chicago, do hereby express to his bereaved family and business associates our deepest sympathy in this hour of their sad bereavement and irreparable loss.

Resolved, That in the death of Mr. E. Anthony the photographers and photographic merchants of the United States have sustained the loss of one of their most active and honored friends, and that the entire fraternity may with profit to themselves emulate the high moral character and active honorable life which formed the chief characteristics of his career and constituted the foundations of his success.

Resolved, That a copy of these resolutions be furnished to the family and business firm of the deceased, and to all the photographic publications of the United States.

H. J. THOMPSON,
N. C. THAYER & Co.,
SMITH & PATTISON,

SWEET, WALLACH & Co.,
G. A. DOUGLASS & Co.,

BLAIR CAMERA Co.,
J. A. ANDERSON.

PICTURE NOTES.

QUITE a number of fine pictures have come to our table lately, and want of space has prevented our taking notice of them before. F. H. Brown sends an excellent view of an old tree and farm house nestled beneath it, that strongly reminds us of some of the beautiful views taken by Professor Burnham, and used as illustrations to the BULLETIN some months ago. It is a very artistic picture. G. F. Chapman, of Whitby, Ontario, has been doing some very fine work. A portrait of himself sitting in a window is very well done; a picture of a handsome black dog holding a basket in his mouth, is an uncommonly clean and sharp piece of photographic work. He also sends two other views; one a triumphal arch erected at Beaverton, Ontario, in honor of Sir John A. McDonald, the premier of Canada; and another an instantaneous view at Beaver River. All these pictures are well done and deserve commendation.

Mr. Louis F. Drake sends us a fine blue print of a Colorado view, which is remarkable for fine detail and excellent cloud effects. It is a picture of an old over-shot water saw mill; quite a rare thing to see in the West. The picture is finely taken in every way.

We are indebted to Mr. Albert E. Duckham, of Ithaca, N. Y., for a very pretty view of the Lower Triphammer Falls of Ithaca, taken in winter. The ice effects are very well caught, and speak well for the skill of the maker of the negative.

From Mr. A. E. Culver, of Bridgeport, Conn., we have received a very fine landscape view, which he tells us was made with a cheap lens. We must confess that there are few pictures made with expensive lenses that can surpass it either in detail or depth of definition. It is a wonderfully good picture.

Stauffer, of Asbury Park, N. J., has taken some very fine views of the ocean along the coast of New Jersey, and also some beach scenes. In one of these ocean views are three sets of waves, all finely caught and full of motion. Another one is a windy day on the ocean, with some excellent effects in both water and clouds. All these pictures show careful work and skillful photography.

J. O'Neil, of New Bedford, Mass., sends us an excellent view of his reception room. It is certainly a handsome interior.

A couple of beautiful Swedish views come to us from A. E. Thorburn, at Uddavalla. One is a view in summer, showing a rippling brook with bending trees reflected in its still pools. The other is an ice-bound scene near Uddavalla, showing the effect of winter. Both are exceedingly picturesque, and excellent pieces of photography.

McMillan Bros., of Santa Maria, Cal., send us a very good vignetted portrait of a child, with a black background, that is well done. It lacks a little in detail in the hair and the lace collar of the child, but is good, nevertheless.

Hoffmann, of Shenandoah, Penn., sends us a number of fine cabinet pictures that show excellent photographic work, good modeling, careful posing and excellently clean negative work. It is certainly a pleasure to look upon such neat and artistic productions.

"Pretty Poesy," a cabinet picture of a little child standing in a bed of flowers and holding one in her hand, wrapt in admiration, is a very pretty little study and well carried out. We like to see photographers take an interest in such work; it teaches them far more than long discourses upon art would ever do. This picture is from the studio of Berryman, of Midland, Mich.

THE LIGHTING IN PHOTOGRAPHIC STUDIOS.

BY P. C. DUCHOCHOIS.

(Continued.)

Pose the model about at the center of the skylight, so that the light plays all around it, using now little side light, and turn the head slightly away from the light in placing the camera diagonally, as it is proper. In this position, the shadow under the eyebrows, the chin, etc., is exaggerated, but the moment a semi-opaque head screen is placed over the head of the model, the rays of light falling perpendicularly upon it are diverted from their course, and the light diffused around the figure illuminates it with soft gradations.

By raising or lowering the head screen, by turning it to a certain angle, the lighting is altered at will, being softened or rendered more vigorous. If the face be not well in relief, too flat, throw more direct side light in front of the model to illuminate more strongly the predominant parts, and at the same time that thi

effect is produced, more shadows will be cast on the opposite side. Or incline upward the head screen toward the shadowed side to admit more light from above, when more contrasts will be obtained.

If it happens that the shadows—on the neck specially—are too dark, they may be softened either by a side transparent screen to alter the opposition of dark and light, or, better in this case, by a light rose or blue reflector placed so as not to project a luminous point in the eye. For this purpose a small mobile concave reflector, which can be raised to any height and turned to any angle, as advised by Mr. Klary, is most convenient. This head reflector may be fixed to a success head rest, just as the head screen.

By experimenting with the head screen, one can produce with the greatest ease almost any effects of light and shade.

It is when the studio is lighted only from a glazed roof, or when the sitter is posed with the head turned to the upper light, that the head screen is quite indispensable. Lately we have seen made by an artist photographer, whose works are ordinarily of a high order, the portrait of a celebrated comedian, dressed *à la* Louis Quatorze, reclining on a chair. The face on which the light falls is flat, without character, all the *méplats* being drowned in the light. Had he employed a colored semi-opaque or even an opaque head screen or canopy, the picture would have been exceedingly improved without it being necessary to lengthen the time of exposure.

The lighting *à la* Rembrandt of the photographer presents great difficulties. This style never was employed by artists for portraits. Those great light and dark contrasts, so effective in *genre* pictures, do no more pertain to the composition of a portrait than those pretentious and theatrical attitudes so much in fashion now-a-days; for, strange to say, there is a fashion in photography.

To make a portrait is not to represent an action, but a person with its characteristics. The pose should be simple and natural, the lighting not exaggerated, which does not exclude effect, grace and distinction. But certain photographers would not be satisfied unless they invent every day half a dozen of new poses, twisted one more than the other.

Select a hundred portraits by the great masters of every school: you will be astonished to observe that the same attitude is repeated with little variations—the body and the head being slightly turned—and that the character of the picture resides entirely in the true representation of the person; the draperies, the accessories, and the background treated with the importance they merit, adding to the general effect of the picture.

To light a model Rembrandt style, that is to say, one side of the head in the light and the other in the shadow, the latter being the broad side of the head, three causes of defects should be avoided: first, too great an opposition of light and shade, which produces harshness, then flatness in the shadow-side; and lastly, the use of an ordinary white reflector which, as before stated, reflects the light upwards, causing a false illumination and an objectionable reflection in the eyes.

The model should be seated in the center of the light, near to the side light—about five feet from it—and the head turned in a diagonal to the light.* The

* This is one manner of lighting. The Rembrandt effect can be obtained in other positions by the use of the head screen or canopy to soften the top and side lights, and the head reflector to project half lights on the shadow-side.

shaded side of the head is generally in that position, flat, without *modellé*, and should be relieved by means of the concave reflector placed a little above the head, in order to reflect the light downward in a direction almost similar to that of the light. The head screen also comes into play to protect the hair and cast a shadow on the lighted side, in order to avoid too great a contrast of light. This arrangement requires practice to produce a just effect. As to the background, care should be taken to oppose light to dark and dark to light to relieve the whole figure.

There is a style of pictures "suitable for ladies and pretty to a degree," the specialty of the Maison Joliot, in Paris, which is almost unknown in New York. We refer to the *Cartes Russes*, or bust pictures, on a black background. Here—says Mr. Baden Pritchard, describing in his interesting work, "The Studios of Europe,"* the manner in which these cartes are made—there is a background of a dark red color, so dark that it scarcely appears red at all. To produce the *Carte Russe*, the sitter is placed some eight feet from this background, so as to permit plenty of light to intervene between it and the model; the result is that the finished portrait has something of a Rembrandt look, the features rounded and standing out well in relief. On the shadow side of the sitter, either white or blue curtains are arranged, to reflect back the light and not to permit too much shade on this side of the face. A negative taken under these circumstances does not require to be manipulated at all so far as face and shoulders are concerned, since these stand out boldly from the background when the negative is printed; but some skill is necessary to cut off the bust and print the paper black below the portrait. Portraits produced in this way, especially of ladies in light summer or ball-room dress, are exceedingly effective. Costumes in white, blue, violet, mauve, rose and light gray are specially to be chosen for *Cartes Russes*, since, according to Mr. Joliot, they give the best results.† Black dresses should be avoided, of course.

The reader will perceive that the model can be easily lighted for the *Cartes Russes* by the head screen or canopy and the mobile reflector. As to the vignette gradation, it is obtained without any difficulty whatever by exposing the proof to light on its removal from the printing frame under a vignette glass—or a vignette paper—black in the center and shaded the reverse of that usually employed for the ordinary style of vignette.

The gradation can also be produced on the negative itself by interposing a small notched circular dead black mask at a certain distance between the sitter and the lens, and adjusted so as to show on the ground glass of the camera a vignetted image, and then tinting the prints as above explained.

(To be continued.)

[From Photographische Correspondenz.]

THE PYRO DEVELOPER WITH METABISULPHITE.

BY DR. J. M. EDER.

LATELY I called attention to the metabisulphite of potassium as an addition to the pyro solution for development, and can give now some of my experiences with this salt.

The metabisulphite of potassium, which was introduced into the market by

* American edition, pp. 209-210. Published by E. & H. T. Anthony & Co.

† Any lighting answers well, but a true Rembrandt does not show with advantage in that style of picture.

Dr. Schuchardt, and whose correct analysis is not known yet, is a white crystal, which in a solid condition as well as in an aqueous solution has a strong smell of sulphurous acid. An aqueous 2 per cent. solution of this salt dissolves pyrogallie acid to a weak yellowish color, being distinguished from the more light-brown solution of sulphite of soda and pyro. The solution kept very well for four weeks in half-filled bottles, and showed a better preservation than the usual solution of pyro and sulphite of soda.

More than 2 per cent. of the metabisulphite of potassium is without any advantage.

If this solution is mixed with soda, a picture will develop rapidly, but the same will show a strongly yellow coloration in the gelatine film. Sulphite of soda has to be added to the soda solution, to obtain an agreeable brownish or black tone in the negatives.

If the contents of metabisulphite and pyro-soda developer are increased, it will act very slowly; larger quantities of the metabisulphite of potassium therefore act like a strong retarder. In small quantities there is no injurious retarding action, but it will have the effect, that the plates obtain very clear shadows in this developer, and that the picture appears slower and will strengthen more slowly. The strongly retarding action of larger quantities of metabisulphite might be accounted for in that the bisulphite will give with the carbonate of soda, monosulphite and soda bicarbonate, which latter is not a strong enough alkali to develop the bromide of silver strongly with pyro. An increase of soda compensates this retarding action of the metabisulphite of potassium.

Good results were obtained by me with this salt after several tests, by producing the following solutions :

A.

Pyrogallie acid.....	4	grams.
Metabisulphite of potassium.....	1½	"
Water.....	100	c.c.

This solution keeps for weeks in corked bottles.

B.

Crystallized soda.....	10	grains.
Neutral sulphite of soda.....	15	"
Water.....	100	c.c.

Before using mix :

Pyro solution (A.).....	20	c.c.
Soda solution (B.).....	20	"
Water.....	20	"

The developer acts about one and a half times slower than the ordinary pyro-soda developer, approaching to the latter pretty nearly, and gives to the negatives an agreeable color and softness, with clear shadows. If the negatives are to be thinner, more water, say 30 to 40 c.c. is taken. If denser, then the soda is increased and the water in the developer is reduced. An alum bath before fixing is to be recommended.

An advantage of this development is the great durability of the pyro-meta sulphite solution. The cost price is about the same as that of the ordinary pyro-developer. At all events it is worth while to make further investigation with the metabisulphite of potassium, the same being also a good preservative for hydroquinone solutions.



COMPARATIVE TESTS OF THE DEVELOPERS WITH HYDROXYLAMINE CHLORIDE.

BY ALEX. LAINER.

THE fact that the hydroxylamine chloride develops very powerfully, giving at the same time very brilliant negatives of great clearness, has caused me to collect the notices about this from the several journals, and submit the same to an investigation.

In consequence of certain advantages over the pyro soda developer, the hydroxylamine developer would be certainly in more general use if the formation of bubbles, etc., was not a constant companion.

The cause of this, as generally regarded, consists in the formation of gases, namely that of nitrogen and oxide of nitrogen.*

The means to prevent the formation of bubbles were mostly directed to a hardening of the film, resulting, according to my opinion, in just the opposite effect. With better results I tried to loosen the same by applying sugar and glycerine in the developer, thus opening the pores of the gelatines, and facilitating the escape of the gases. Dr. Lossen says, that the nitrogen and the oxide of nitrogen are perceptibly more soluble in cold than in warm water, and that an addition of cold water would remedy this, if the development was not slackened simultaneously.

The formation of bubbles is much more energetic when the hydroxylamine solution is concentrated and the stronger the additional base is. For such tests I used potassium hydroxide, sodium hydroxide, calcium hydrate, carbonate of potassium and barium hydrate. All tests with these substances and hydroxylamine chloride, resulted in reductions.

The tests made and the results obtained were as follows :

At first I developed one of the dry plates with the ordinary pyro soda and one with the oxalate developer for the sake of comparison.

The pyro soda developer gave 20 degrees W. with great strength and clearness. The oxalate developed number 23 of the Warnerke sensitometer, but at the same time it showed a formation of fog.

1. Water, 60 c.c. ; hydroxylamine chloride, 0.3 grams ; caustic soda, 0.4 grams: upon ordinary and gelatine emulsions, with chrome alum, with or without addition of sulphate of soda (glauber salts) to the developing solution. Addition of glycerine reduced the formation of bubbles; and 20 degrees W. were obtained with very little density. Bromide of silver gelatine paper gave good results, great density, no formation of bubbles, no fog. The solution can be used frequently in succession.

2. Hydroxylamine chloride and potassium lye: 20 degrees W., very little strength, formation of bubbles.

3. Hydroxylamine chloride and potassium carbonate: 20 degrees W., handsome gradation, strong formation of bubbles.

4. Hydroxylamine chloride, 25 drops (1:5), and lime sugar solution 50 c.c. : 20 degrees W., very thin, clear, free from bubbles. By changing the proportion of mixture, to obtain more strength, a formation of bubbles and fog could be observed.

* Photographic Archir, No. 595, Dr. Lossen.

$3 \text{ N H}_3 \text{ O} = \text{N}_2 + \text{N H}_3 + 3 \text{ H}_2 \text{ O}$ or $4 \text{ N H}_3 \text{ O} = \text{N}_2 \text{ O} + 2 \text{ N H}_3 + 3 \text{ H}_2 \text{ O}$.

5. Hydroxylamine chloride and caustic baryta:

- (a), 50 c.c. caustic baryta + 10 drops hydroxylamine chloride: 15 degrees W., some fog, some density, without bubbles.
- (b), 50 c.c. caustic baryta and 25 drops hydroxylamine chloride: 17 degrees W., fog, dense, bubbles.
- (c), 10 c.c. caustic baryta, 20 c.c. sugar solution (1:10), 12 drops hydroxylamine chloride: 20 W., very clear, formation of bubbles not much visible, somewhat thin.
- (d), 20 c.c. caustic baryta, 20 c.c. sugar, 20 drops hydroxylamine chloride: 20 degrees W., strong, very little formation of bubbles.

The latter mixture gave with this and other tests the best results. As a disadvantage, may be mentioned the want of constancy of the baryta solution, which becomes cloudy very soon in consequence of the formation of carbonate of baryta.

Stebbins and Cassebaum published developer formulae of pyro soda developers with hydroxylamine chloride. Cassebaum says:

"I find that the hydroxylamine in connection with pyrogallie acid is not only a valuable addition to keep the solution of the pyro clear for an indefinite period, but it possesses advantages which the pyro alone has not got."

He mixes 3-7 grams of a pyro solution with 224 grams of the soda solution:

A.	
Hydroxylamine.....	3.85 grams.
Pyrogallie acid.....	28 "
Water.....	168 "
B.	
Soda.....	42 grams.
Sulphite of soda.....	132 "
Water.....	132 "

This developer is recommended by Cassebaum particularly for lantern slides and transparencies, and he mentions particularly the depths of the bluish black tones, obtainable with the same, as also their rich gradations.

The test with above formula gave by application of the minimum of 3 grams of the pyro solution, 18 degrees W. very little density, flatness; with the maximum of 7 grams pyro, great density, handsome gradation, 18 degrees W.

The developer of Stebbins has the following composition:

A.	
Hydroxylamine.....	2 grams.
Pyrogallie acid.....	15 "
Water.....	100 c.c.
B.	
Soda.....	34 grams.
Sulphite of soda.....	70 "
Water.....	1,000 c.c.

For use mix 2-4 A with 75 B.

6. Experiments:

- (a), 2 A with 75 B gave 19 degrees W., good gradation, clearness, normal density.
- (b), 4 A with 75 B gave 20 degrees W., great density, clearness.

A comparative table of these two developers with the pyro soda developer shows their relationship with the same. For this purpose I calculated all formulæ upon the value of 100 c. c. mixed developer:

CONSTITUENT PARTS.	CASSEBAUM.	STEBBINS.	ORDINARY PYRO DEVELOPER.
Soda.....	2.50	2.40	3.33
Sulphite of soda.....	7.86	7.00	6.66
Pyrogallic.....	0.52	0.81	0.93
Hydroxylamine.....	0.7	0.11	.....
Water.....	100.	100.	100.

Further tests with these developers showed that the sulphite does not become superfluous on account of the hydroxylamine chloride, as the negatives will turn completely yellow without sulphite. If the hydroxylamine chloride is increased, the soda should also be considerably augmented.

Otherwise no particular success could be obtained with the developers of Cassebaum and Stebbins against the ordinary pyro soda developer.

Based upon this table and the examination of all information upon the application of the hydroxylamine chloride for developing the bromide of silver gelatine dry plates, I believe, and the verdict is justifiable, that the pyro soda developer, as well as the oxalate developer (aside from hydroquinone), is not surpassed for general use by any other developers, especially the hydroxylamine, in respect to a sure and certain application.

THE LARGEST CAMERA IN THE WORLD.

BY HENRY HARRISON SUPLEE.

[Read before the Photographic Society of Philadelphia.]

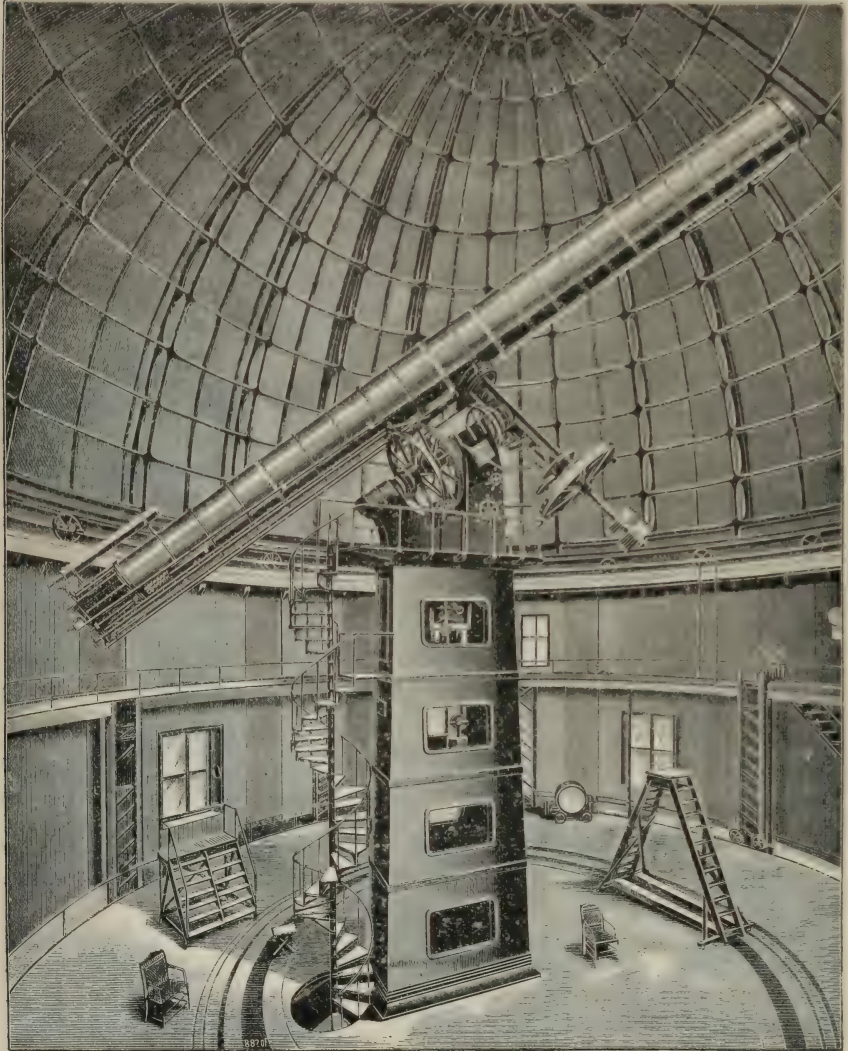
THE recent completion of the great Lick telescope, and the success which has attended its use for general astronomical purposes, have been subjects of interesting discussions, both among astronomers and mechanicians, and an examination of the photographic features of the instrument may not be without interest to photographers. Before entering into a description of the attachments of the telescope which are particularly devoted to photography, a brief general account of the instrument may be necessary in order to make clear the arrangement of the parts.

As the vital point in a camera is the lens, so the objective is the great point in a telescope, and the objective of the Lick telescope, the last and greatest work of the veteran Alvan Clark, is the first and most important part of the instrument. The clear diameter of the lens is 36 inches, and it is composed of two disks of crown and flint glass respectively, both disks being cast by Feil, of Paris, and ground and figured by Mr. Clark, at Cambridgeport, Mass.

The production of a satisfactory and homogeneous disk of glass, free from waves and striæ of unequal density, is a most difficult matter, and in the case of the disk of crown glass a satisfactory casting was secured only after nineteen failures. The crown glass lens is a symmetrical double convex figure, both faces being worked to curves of 259.52 inches radius, and the double concave flint disk has its front face worked to a radius of 239.59 inches, and its back

face is curved to a radius of 42,000 inches. The disks are not cemented, but are mounted $6\frac{1}{2}$ inches apart, the combination having a focal length of 675 inches, or 56 feet 6 inches.

This lens, the largest in the world, is mounted in a tube of cast-iron and steel, the tube being 4 feet in diameter in the middle and tapering to 3 feet at the ends. This is mounted equatorially, and some idea of the weight and



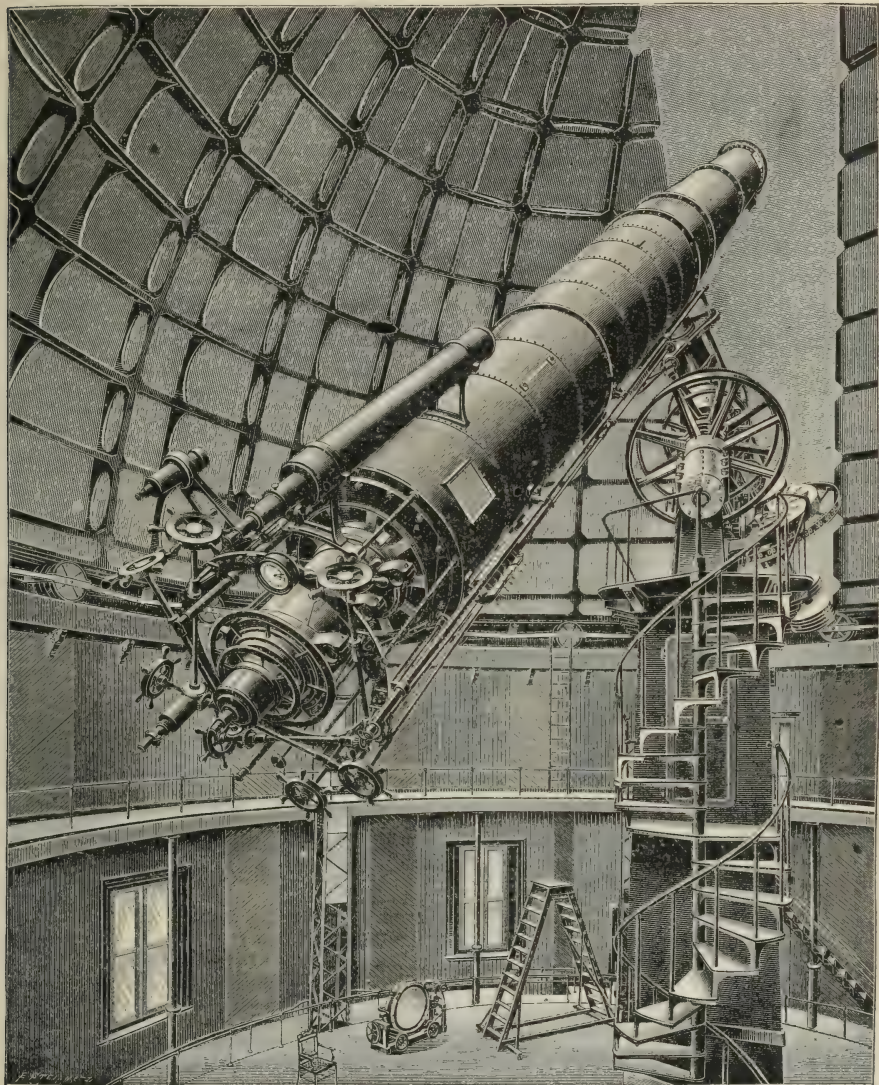
36-INCH EQUATORIAL TELESCOPE, LICK OBSERVATORY.*

solidity of the parts may be obtained from the fact that the polar axis is a steel spindle 10 feet long and 12 inches in diameter, and it alone weighs 2,700 pounds. The weight carried by this axis is about 20,000 pounds, and in order to relieve the spindle as much as possible, a series of anti-friction rollers are placed just beyond the first bearing to take a portion of the weight.

* We are indebted to the *American Journal of Photography* for the use of these handsome cuts.

The instrument is mounted on a hollow cast-iron column, built up in sections, the driving clock and regulator being placed in the column and connected by electric control with a standard astronomical clock, and with the chronograph.

The control of the telescope in all its movements is effected by the numerous handles which are gathered around the eyepiece and upon the top of the column.



36-INCH EQUATORIAL TELESCOPE, LICK OBSERVATORY.

The instrument is intended to be controlled by the observer and an assistant on the column, although for rapid movements in right ascension and declination help may be given by an assistant on the floor. The various handles and attachments for the use of the observer are mounted on a large ring around the eyepiece, which carries the handles for clamping the instrument or giving slow motion in right ascension or in declination, and also carries the reading micro-

scopes and finders and a small sidereal clock. Electrical switches are also provided by which the driving clock can be started or stopped, and the illumination of the divided circles controlled.

It has been customary in large telescopes to provide a chair for the observer, which followed the motion of the eye end of the instrument; but the inconveniences of this method increase with the size of the apparatus, and in the case of the Lick telescope it was decided to adopt the method proposed by Sir Howard Grubb, of making the entire floor of the dome rise and fall to bring it at all times within a convenient distance of the eyepiece. As this movable floor is $61\frac{1}{2}$ feet in diameter, and has a rise and fall of 16 feet, the magnitude of the task is apparent. The motion of the floor is caused by four telescopic hydraulic rams operated by a differential valve provided with an indicator which may be read in the dark. A hole in the middle of the floor provides space for the column of the telescope and for a staircase, and the entire motion of the floor is accomplished upward in less than nine minutes, and downward in five minutes.

The great dome is also controlled by hydraulic power through the medium of an endless wire rope, and in this manner the unusually heavy parts are kept as completely in hand as in the case of smaller and lighter apparatus.

The most interesting part of the outfit to photographers, lies in the accessory apparatus for use in celestial photography; and as the telescope when arranged for photography may be considered the largest camera in the world, some of its details in this direction are worthy of especial notice.

In the first place the objective was figured and corrected solely for visual purposes, and was therefore unsuited for photographic work; and in order to provide the necessary correction, an auxiliary corrective lens was made to be mounted in front of the original lens.

This corrective lens is of crown glass 33 inches in diameter, and may be seen in the illustration on the floor, on its carriage which has been provided for handling it. When this lens is placed in front of the regular objective, it not only makes all the corrections necessary for photographic work, but also shortens the focal length of the entire combination 10 feet, thus making the position of the plate holder come some distance within the eyepiece. This permits the entire apparatus about the eyepiece to remain undisturbed when the telescope is used for photography, the holder and its attachments being introduced into the tube through an opening in the side.

Within the tube at this point is a carriage composed of two rings of about the inside diameter of the tube, these rings being connected together by four rods. On these rods the sliding portion of the carriage is fitted, and by means of screws the frame may be moved and adjusted in any desired position. As the rays of light from celestial objects are practically parallel, the camera is of fixed focus, and when the proper point is once determined there is no use for any focussing screen, and the screw motion which acts on the carriage is provided with a pointer which indicates the exact focus. This pointer traverses past an index which is graduated for various degrees of temperature, for the expansion and contraction of the great tube would otherwise destroy the sharpness of the image.

The plate holder, 23 inches square, carries a plate 20 x 20 inches, and slides into grooves in the carriage, where it is held by a spring. The holder is pro-

vided with shutters which are operated from without the tube, so that exposures may be made in that manner.

When an enlarged image is desired, the holder is not slid into the carriage, but in its place is put an enlarging lens of 2 inches aperture and 12 inches focus. This magnifies the image formed by the large objective, and projects it toward the eyepiece, which is then removed, and a small camera substituted to receive the enlarged image. This enlarging lens is fitted with a time and instantaneous shutter, operated from without the tube, so that enlarged photographs of the image formed at the focus of the telescope may be made direct, without being reproduced as in ordinary methods of enlarging.

Although the telescope as a camera has been in use such a short time, some very satisfactory work has been done, and the great light-gathering power of the 36-inch objective will doubtless reveal detail in the photographic work that a smaller instrument would be unable to secure.

Great credit is due to Messrs. Warner & Swasey, of Cleveland, Ohio, for the skill which they have displayed in the designs for the mounting of the telescope, and for the care with which the work has been executed; and the success of the great camera is due quite as much to the designer of the mechanism as to the maker of the lens.

DEVELOPMENT BY SEPARATE SOLUTIONS.

By D. BACHRACH, JR., *Baltimore.*

[Read before the Society of Amateur Photographers of New York.]

In a foot note in "Wilson's Quarter Century in Photography," I say, "It has for a long time been my opinion, both from theory and some experiments that I made, that the present method of mixing both the pyro and alkaline solutions when developing, was neither the best nor most economical method, if, as I think, we can now mix up an aqueous solution of pyro that is stable and will not change. Those who understand the chemical action involved, are aware that pyro occupies almost precisely the place of free nitrate of silver on a collodion plate, and that the sal-soda or ammonia the place of the sulphate of iron or pyro, whichever was used. Acting on this theory I developed a few plates by first immersing them in a strong pyro solution for a minute (which I then drained off again into the bottle), and then developing them with the sal-soda solution, using the same quantity of water as if the solution had been mixed in the usual way. The result was as good as the best developed plates by the other methods. It will be seen that several advantages are gained: 1st, the immersion in the strong pyro causes a uniform absorption of it all over the plate. 2d, at least two-thirds of the pyro is saved."

The formula given in the foot note is as follows:

PYRO SOLUTION.

Sulphite of soda.....	4 ounces.
Water.....	16 "

Add enough sulphuric acid to turn litmus paper decidedly red.

Pyrogallic acid.....	1 ounce.
Bromide potassium.....	$\frac{1}{4}$ "
Sulphate magnesium.....	1 "

ALKALI SOLUTION.

Sal soda, crystalized.....	$\frac{1}{2}$ pound.
Sulphite of soda.....	$\frac{1}{4}$ "
Bromide of potassium.....	$\frac{1}{2}$ ounce.
Water.....	1 quart.

Of this alkali, take half an ounce to two and one-half ounces of water.

When a plate is to be developed, it is dipped first in the pyro solution, not over a minute, and taken out and drained, and then developed with the alkali.

The sulphate of magnesium is added to the first solution to prevent the softening of the gelatine, which is likely to occur when the solution is either warm or tepid.

A member of the Society of Amateur Photographers of New York wrote to me concerning this method of development. I replied that I had been using it lately exclusively on 11 x 14 plates and less, and am as well pleased with it now as when I first introduced and published it about three years ago, for its cleanliness and regularity of result, as well as rapidity of development.

The following is the formula I now use:

SOLUTION NO. 1.

Pyrogalllic acid	1 ounce.
Sulphite of soda (crystals).....	4 ounces.
Oxalic acid	20 grains.
Distilled water.....	1 quart.

SOLUTION NO. 2.

Sal soda (crystals)	2 ounces.
Sulphite of soda (crystals).....	2 "
Water	1 quart.

I have two dishes, one for enough of No. 1 to cover the plates, and one of the same dimensions for No. 2. Soaking for half a minute in No. 1 and then developing in No. 2 proceeds regularly right along until all the plates are developed.

But I must caution the beginner to always have some old developer of the previous day at hand to start with, by adding to the No. 2 solution, else the first plate or two will lack vigor. As the development proceeds, and in case of a large batch I find the solution of No. 2 to act a little slow, or with more contrast than I wish, I pour off a little and add fresh solution. In this way I have developed thirty to forty negatives of all sizes, with one assistant, of a very uniform intensity, in less than half an hour. The plates used were Carbutt's and Cramer's. I do not see any advantage in this method to amateurs who have only a few plates to develop at a time, and can watch each one carefully; but to the professional photographer who works with pretty uniform conditions of light, and gets somewhere close to the proper exposure, it offers the most regular, cleanly and rapid method of development I know of. In addition, it is very economical, as not over one-third the amount of pyro is used as by the regular method of developing in one solution. Each plate absorbs sufficient pyro to produce the proper result, and hardness is avoided. For cases of extreme over-exposure, where "doctoring" is necessary, this method will not do, and a powerfully restrained developer in the usual style is necessary.

But I am indebted to the inquiry of the gentleman referred to in the first part of this paper, for it induced me to try hydroquinone (which I had abandoned on account of its tendency to harsh results when development was prolonged) in the same manner, and I must say that I was surprised at the result. It gives me the best class of quick-printing negatives I have yet been able to obtain, and especially is it good for very rapid plates that have a tendency to fog. I use it now almost exactly as I have described for pyro—in fact, substitute, in the formula above given, hydroquinone for pyro (leaving out the oxalic acid), and you have a developer giving better results than any formula yet proposed for hydroquinone. All tendency to extreme hardness is avoided by the method of first soaking in the hydroquinone solution and then developing in the soda solution, and the action is also much more rapid than with the old formulas. The dish in which the plates are developed (No. 2) must be kept rocking (with both the pyro and hydroquinone developers) until the image begins to assume strength, to prevent uneven development. In the first soaking (No. 1) this is not neces-

sary. I have fully determined to adopt this method of development with hydroquinone in our establishment.

It will be observed that I have omitted in my second formula of developer both the bromide of potassium and the sulphate of magnesium, as they are unnecessary, because the weather now is cold enough and the plates I am using do not seem liable to frill, and I believe in simple formulas. I have also tried the addition of phosphate of soda, as recommended by Mr. Gilder, an amateur of Baltimore, but fail to see any difference in the result. It may be there is virtue in it, but I have not the time to give a careful test. I am opposed *a priori*, to complicating formula with apparently inert substances, though perhaps I may be mistaken in this case.

I think this method with hydroquinone is of importance to the profession, as it is, as I have before stated clearly, regular in results, rapid in development, and economical, as both the pyro and hydroquinone solutions will keep until used up. The alkali solution also keeps well.

COLLODIO-BROMIDE EMULSIONS.

BY F. C. BEACH.

[Read before the Society of Amateur Photographers of New York.]

IN bringing this subject to your attention, I am reminded of the fact that it is nearly ten years since I had the pleasure of experimenting with collodio-bromide emulsion, not so much in manufacturing them as in using those put on the market at that time, made after the formula of Mr. Henry J. Newton. We then had to prepare our own dry plates and give a considerably longer exposure than is now necessary, but we had the satisfaction of obtaining beautifully clear, crisp and dense negatives. There was more latitude in exposure and development than now.

Considerable attention has been given of late to lantern slide making, and as a few of our members have had difficulty in obtaining good slides on the special gelatine lantern commercial plates, owing to a loss of sensitiveness or foginess and flatness, which does not fully show itself until after the plate is fixed, it occurred to me it might be useful to explain a few formulas for making and using collodio-bromide emulsions, for the reason that they are rather more convenient for the amateur than the use of the ordinary wet plate collodion process, since the use of the silver bath is avoided, and beautiful crisp slides, full of clear, bright lights, are readily obtained.

In making lantern slides a slow washed collodio-bromide emulsion is preferable; one to be had ready prepared, that gives fine results, is made by Mr. William Brooks, of Reigate, London, and it is what I have been lately experimenting with. The formula for making the emulsion was given by Mr. Brooks to a Mr. Frederick Dunsterville, of Rayapuram, Madras, and what follows will be a description, taken from Mr. Brooks and Mr. Dunsterville's directions.

Prepare three separate solutions, in ordinary daylight, as follows :

PLAIN COLLODION.

Alcohol, methylated.....	4½	drams.
Ether.....	3½	“
Gun-cotton, high temperture	12	grains.

BROMIDE SOLUTION.

Alcohol, methylated.....	1½	drams.
Ammonium bromide.....	13	grains.
Distilled water.....	20	minims.

SILVER SOLUTION.

Silver nitrate	20	grains.
Distilled water... ..	12	minims.

The most important feature of these solutions is the employment of a suitable kind of pyroxyline or cotton (in this country Hance's is considered the best), then the process is comparatively easy and certain. Make a stock of plain collodion and let it rest for some time, so that all insoluble particles and other

impurities may sink to the bottom. Tall, narrow bottles are best to store it in. The proportion for a stock solution may be :

Alcohol.....	22 ounces.
Ether.....	18 “
Gun-cotton, high temperature.....	1 ounce.

Referring to the three solutions before mentioned : The bromide should be made by first dissolving the bromide of ammonium in the given quantity of water, heated to near the boiling point, then when cooled to 70 degrees F. the alcohol is added. The water of the silver solution should also be warmed to dissolve the silver easily and rapidly.

To make the emulsion, pour 1 ounce of the prepared plain collodion into a clean 4-ounce bottle with glass stopper, then add the bromide solution as previously given, shaking well for some minutes. The bottle containing the bromized collodion should then be taken to the dark room, and the silver solution added little by little, shaking well between each addition. It is well to rinse out both the bromide and silver bottles with a little of the collodion, to insure the whole of the salts being taken up. The emulsion should then be kept in the dark room for about twenty-four hours, shaking well at frequent intervals, and when ready for washing it should be poured into a glass dish, which should be large enough to contain the quantity of emulsion in a mass not thicker than one-eighth of an inch. As the solvents evaporate a skin forms on the surface, which should be broken up occasionally with a silver spoon or ivory paper knife. When the solvents are completely evaporated the pellicle should be washed in distilled water for half an hour or so, until all the soluble salts have been removed.

The pellicle should then be squeezed in pieces of clean calico until as much as possible of the water is removed, and it can then be dried by moderate heat over a water bath. The whole of the washing process should be done in a dark room or at night time by the light of a candle placed at some distance.

When quite dry the pellicle may be re-dissolved in three-quarters of an ounce of alcohol absolute (0.805) and three-quarters of an ounce of ether sulphuric pure (0.720), pouring the ether on first ; and when all the pellicle is dissolved, the bottle (a 4-ounce one) should be well shaken up, and in about twenty minutes to half an hour will be ready to coat plates, after being filtered. It will be a milky colored solution, resembling somewhat cream in consistency.

The filter for the emulsion may be merely a small funnel, with a little tuft of cotton jammed in it, through which a little alcohol should first be run, or, what is better, the first portion of emulsion running through may be returned to the filter. A friend of mine, Mr. A. S. Murray, advises the use of paper filters instead of cotton, for he found particles of the cotton would find their way into the emulsion and cause specks on the plate.

Before coating a large number of plates it is advisable to test the emulsion in the dark room, to see that it is free from fog, by coating a plate; as soon as the film is set wash it in clean water by soaking until all the ether and alcohol are removed, which will be observed as soon as the greasy lines disappear. Then pour over the plate a little developer of full strength, and after letting it remain on the plate for a few minutes, wash well and fix it with a solution of cyanide of potassium.

It should be absolutely free from fog and stains. Stains may be due to the plates not being chemically cleaned ; but if fog is present a drop or two of an alcoholic solution of iodine, added to the emulsion, will effect a speedy cure.

The emulsion must then be well shaken up again and allowed to rest half an hour before re-filtering and coating plates.

Having thus prepared the emulsion or purchased it already made, the next step is to coat the plates. These must, however, be first cleaned and prepared with a substratum, or edged with a rubber solution or some other substitute to hold the film firmly on to the glass. Mr. Dunsterville recommends soaking them in a dilute nitric acid solution (acid one part, water ten parts), then rinse them in plenty of clean water, drying them with a clean cloth. They should then be polished on both sides with a cleaning solution (say tripoli

powder mixed with methylated alcohol and a little ammonia), care being taken to wipe off the edges that were clamped in the vise, with a clean cloth. They should then be either edged all the way around one-eighth of an inch wide with a rubber solution, or they may be dipped in a hot solution of gelatine (20 grains to 20 ounces of water), and dried with a clean cloth.

Mr. Brooks advises that the plate be cleaned with a piece of clean rag, moistened with methylated alcohol, and polished with a clean chamois leather, kept for the purpose only. No substratum is recommended. He says after cleaning the plate, holding it on a pneumatic holder, edge it with a rubber solution (this is to prevent the film from slipping during the after manipulation). The solution is best applied with a camel's hair brush cut down almost to a stump, with a piece of wire or a slip of glass tied on the side, projecting below about one-eighth of an inch, to act as guide. I followed this method of cleaning, purchasing some new glass. I soaked it in nitric acid and water, then washed it and cleaned by placing the plate in an ordinary wood screw vise, pouring on a little alcohol, and polishing with soft paper called "Joseph Paper." I then give it an edging of the Eastman rubber solution and coated the plate with the sensitive emulsion.

During the development the film loosened from the glass and became entirely detached, which I could not save. The balance of the plates thus coated I edged with the rubber solution a second time, and these films, in most cases, stood the development and fixing without coming off. Some would loosen slightly at the corners where the edging had not adhered sufficiently. So far, then, as Mr. Brooks' directions relates to the preparation of the plate, they are insufficient, for it is evident the collodion film will not adhere unless the edging solution is applied before and after coating. It was formerly my practice to first flow a substratum of albumen over the plate, then dry, and afterwards flow the collodion; then the film would adhere perfectly. This, I am informed, is now the general practice in the preparation of wet plates.

Mr. Murray informed me that he prepared a solution of albumen by beating up the white of an egg with an egg beater, then allowing it to settle for twenty minutes, and re-beating a second time. It is then filtered through a paper filter, a drop or two of ammonia added, and is ready for use. A glass plate that has been well soaked is washed off under the tap slightly and drained. The albumen solution is poured on at one end and gradually flowed towards the other, driving what water there is on the plate before it. The surplus is drained off into the bottle. The plate is set up in a rack to dry. After this it is coated with the emulsion, and when again dry is edged with the rubber solution. Thus there is no chance for the film to slip. Several plates may be quickly albumenized and kept ready for use in a grooved box, free from dust. Then when it is desired to prepare plates they have only to be coated with the emulsion and edged with the rubber solution, which takes very little time; a dozen can easily be coated in twenty minutes.

Dr. J. J. Higgins recommends the use of gum tolu as an edging solution in place of rubber; it can be obtained at any drug store.

There are, doubtless, many amateurs that never saw a plate coated with collodion; it is very easy when you know how, but there is a slight knack or calculation about it that has to be acquired. Mr. Dunsterville thus clearly describes the process: "After securely fixing a pneumatic holder to the back of the plate, dust the top surface with a flat camel's hair brush, and pour on the center of the plate a pool of emulsion that will cover about one-fourth of the whole area; now tilt the plate slightly so that the emulsion will run to the right hand far corner, then to the left hand far corner, then to the left hand near corner, and finally pour off the surplus by the right hand near corner into the filter; the plate should then be raised to an almost vertical position and rocked vigorously to and fro, to prevent marking or lines; when the emulsion is apparently set and no more drops from the plate, it may be put in a grooved rack to dry spontaneously, or laid upon a flat surface and dried by gentle heat, say 150 degrees F."

Mr. Brooks states that care should be taken to remove any hard particles from the neck of the bottle before coating, and that the plates should be placed an inch and a half apart on the drying rack, which may be set in any suitable cupboard. If they are set closer they will not dry evenly. The plates will dry ordinarily in about two hours.

Coming to the matter of exposure, we find a great difference between these plates and the regular gelatine lantern plates; I should say they were from ten to twenty times slower, as for example, in reducing by the camera. I used a Bausch & Lomb Universal Lens with nearly full aperture, and gave an exposure of six minutes at 3 P.M. with a fairly dense negative backed by a clear sky. In developing I found the plate was very much under-exposed. I then made another exposure of twelve minutes on the same negative, the latter being illuminated by sunlight at 10 A.M., and obtained a fair slide, which, though I used a very weak developer, came out rapidly. In fact it was considered ably over-exposed. Probably six minutes in sunlight, and perhaps four, would have been enough.

I would have given about a minute's exposure on the same negative, using the same lens stopped down to $f/40$ upon an ordinary lantern slide gelatine plate. Mr. Brooks advises an exposure in the camera from one to ten minutes or more, using a quarter plate portrait lens of short focus at nearly full aperture. A long, full exposure gives warm tones, which can be changed to other colors by toning baths; but a short exposure gives cold tones, which cannot be altered by subsequent treatment. In the tropics, where the light is stronger, Mr. Dunster-ville reduces a $6\frac{1}{2} \times 4\frac{3}{4}$ negative to $3\frac{1}{4}$ inches square, using a Ross Rapid Symmetrical Lens at full aperture, and a clear sky as background, at an exposure varying from two to six minutes. This emulsion is therefore better adapted for printing slides by contact than for reducing, though the latter can be done easily enough, if one has the time to spare. In contact work the exposure varies from one to six seconds to diffused daylight; or from two to four minutes 1 foot away from a 6-foot fish-tail gas jet, or the burning, about 18 inches from the printing frame, of 1 inch in length of ordinary magnesium ribbon held in a pair of plyers. During the exposure the magnesium must be moved around in front of the frame to insure even illumination of every portion of the negative. I tried the experiment of burning 18 inches of magnesium in front of the negative. When I removed the plate, to my surprise a faint image of the picture was imprinted on it, which I successfully developed out by weakening the developer. Mr. Murray tells me he has brought such an image out by simply flowing the plate with the ordinary pyro solution. Sufficient ammonia was liberated from the plate to accelerate the action of the pyro.

Too much care cannot be exercised in handling these plates, as the surface is much more delicate than the gelatine plate. The negative must be carefully dusted with a flat camel's hair brush, and then the plate must be laid directly on the negative in the printing frame, taking care that while fastening the springs no sliding or rubbing action takes place.

The springs may be considerably lighter than is usual. The least movement of the plate over the surface of the negative is apt to cause scratches.

The developer advocated as the best is alkaline pyro. According to Mr. Brooks it is prepared as follows:

SOLUTION P.

Pyrogallie acid.....	96 grains.
Absolute alcohol.....	1 ounce.

SOLUTION A.

Saturated solution of carbonate ammonia.....	4 ounces.
Potassium bromide.....	1 dram.
Soda acetate.....	2 drams.
Water.....	12 ounces.

The carbonate of ammonia for the solution should be fresh and hard, and smell strongly of ammonia, otherwise it is of no account.

Four ounces of the salt are broken up and put in a 24-ounce bottle, and 18 ounces of cold water poured on it. The bottle is well corked, preferably with a rubber cork, and is then vigorously shaken. In twelve hours the water should be found to be completely saturated with ammonia and in a prime condition, and if kept in a dark place will last for several weeks.

On mixing the developer, take of—

Solution A.....	3 drams.
Solution P.....	5 to 10 drops.

It will be noticed that solution P has a strength of 12 grains of pyro to the dram, so that ten drops (equivalent to 10 minims), would represent 2 grains of pyro. The amount of solution P is very important; if the negative is very intense two or three drops will be found ample, and will give harmony, but the development will be somewhat slow; in extreme cases the developer may be diluted to twice or thrice its bulk with water. With an ordinary negative the full amount of solution P may be used. A glass dish is best to develop in, so Mr. Brooks advises; but I find it very easy to develop by holding the plate at one corner or by a pneumatic holder or manipulator, and pouring on and off the developer, having a tray underneath to catch any that may spill over. After exposure pour over the plate from a bottle, common alcohol three parts, water one part, and allow it to soak on the film for about half a minute, then immerse in a tray of clean water to soak out the alcohol; when the water blends with the film pour off and apply the developer as previously stated. If properly exposed the image soon makes its appearance and gradually, but surely, gains in intensity.

Mr. Dunsterville uses the same pyro solution, but substitutes for Mr. Brooks' alkaline or A solution, the following, calling it No. 2 solution :

No. 2.

Carbonate of ammonia.....	60 grains.
Potassium bromide.....	5 "
Acetate of soda.....	10 "
Distilled water.....	3 ounces.

Or instead of these, the following :

1a.

Pyrogallic acid.....	1 ounce.
Sulphite of soda.....	4 ounces.
Distilled water.....	9 "

Make faintly acid with citric acid.

2a.

Liquor ammonia.....	1 ounce.
Potassium bromide.....	2 ounces.
Distilled water.....	9 "
To make the developer he takes of P.....	15 minims.
Carbonate ammonia solution.....	2 drams.
Water.....	2 "

Or Instead :

1a.....	40 minims.
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Equal to 4 grains of pyro.

2a.....	10 minims.
Water.....	3 drams.

If the plate is fully exposed, the developer may be diluted with another drachm or two of water. When there is any sign of a veil coming over the high lights, at once wash off the developer and fix the plate, which takes place in less than half a minute, with a solution of cyanide of potassium, strength 20 grains to each ounce of water; wash well by placing the plate in a large dish of clean water for about a quarter of an hour.

The potassium cyanide, as is well known, is a most deadly poison (2 grains being a fatal dose), and it is not necessary to keep the dish containing this solu-

tion in the dark room. If the plate is well washed after developing, it may be safely taken outside the dark room and dropped into the fixing solution, or the latter may be poured upon it and off, the plate being held by a pneumatic holder.

In this connection I may as well state that hypo will fix just as well as cyanide, only it takes longer and also requires more time to eliminate it from the film by washing. Mr. Newton advises fixing with a solution of 4 ounces of hyposulphite soda dissolved in 16 ounces of water.

(*To be Continued.*)

A PHOTOGRAPHIC CORRESPONDENCE.

BY MISS ADELAIDE SKEEL.

S. A. is desirous of taking a few pupils in photography. Instruction by correspondence. For particulars and terms apply to Editor of BULLETIN,
591 Broadway, New York.

27 W—STREET, NEW YORK, August 6, 1888.

S. A.,—Having seen your notice in the BULLETIN, I inclose the required fee (three dollars), and beg you will advise me what books to read on photography. I have had my outfit all summer, but as I am busy down town through the day as a type-writer for the big paint works, Aquarelle & Co., I have no time for picture-making except holidays and sundays. (I don't use a capital S!)

Yours truly, B. JOHNES.

FAR-AND-NEAR, Orange County, N. Y., August 10, 1888.

To B. JOHNES,—Yours of August 6th received. I should advise you to read "Sunlight and Shadow," M. J. Holmes. *Iconoclasm*—a Treatise on Image Worship—reprint, John Knox. The 2d Commandment—Exodus, chap. 20, v. 4; and then if you wish to pursue photography with the hope of overtaking it, let me know.

Yours truly, S. A.

NEW YORK, August 12, 1888.

To S. A.,—Have read and taken notes. Please send examination questions.

Yours, B. JOHNES.

FAR-AND-NEAR, August 14, 1888.

To B. JOHNES,—So glad you can take a joke, even one which, like gelatine plates, has slightly deteriorated with time. Now send me some of your prints.

Yours, S. A.

NEW YORK, August 23, 1888.

To S. A.,—I send you a print of the procession as it passed Aquarelle & Co.'s on Labor Day—what do you think of it? It is one of my best.

Yours, B. JOHNES.

FAR-AND-NEAR, August 27, 1888.

To B. J.,—Send your worst, please. The print you inclose is admirable for illustrating every mistake a beginner can possibly make, viz.: the tripod was unsteady; the image was not sharply focussed; the exposure was too short; the development too long; the albumen paper was not fumed; it is under printed; half fixed; not thoroughly washed; raggedly trimmed; mounted crooked. I shall be glad to hear from you again.

Yours, S. A.

NEW YORK, September 3, 1888.

To S. A.,—You are rather severe, but I dare say I deserve worse. The procession moved, and that blurred the view. I will try on Election Day, and may be one side or the other will stand still. Meanwhile will you not kindly favor me with one of your views, that I may study a good model.

Yours sincerely, B. JOHNES.

FAR-AND-NEAR, September 8, 1888.

To B. JOHNES,—I inclose some views (bromides), of our house and gate-lodge. They are not models of technical perfection, but may give you an idea of what to avoid.

Yours, S. A.

NEW YORK, September 12, 1888.

To S. A.,—Thanks for the lovely views. Indeed I should never wish to avoid so hospitable a looking house should I be fortunate enough to pass through Far-and-Near, which is not likely while I am chained like a prisoner to my type-writer, and I am worked to death by everybody, from the senior partner down to a salesman on six hundred a year! Forgive this personal paragraph. To return to your prints—how I wish they were clearer! Is that blue artistic? Is your house gray stone, and did you take it in the rain? I ask because I want to learn.

Yours sincerely, B. JOHNES.

FAR-AND-NEAR, September 13, 1888.

To B. JOHNES,—I inclose a “blue” to show you that our house is painted white and the sun shone when I took its picture. I fear my iron and oxalate solutions were stale when I made the bromide I sent you. I wish you could see the original with my eyes.

Yours in haste, S. A.

NEW YORK, September 17, 1888.

To S. A.,—I hope I do not presume when I say in reply to yours of September 13—which I have delayed answering because I was so dreadfully busy—that I should be well satisfied could I see your house with my own eyes, but this is impossible; besides you probably have no time for personal interviews with your pupils. I inclose a view of my desk down here at Aquarelle’s, my first attempt at an interior.

Yours sincerely, B. JOHNES.

FAR-AND-NEAR, September 18, 1888.

To B. JOHNES,—I think the view technically good, but the composition lacks one thing—you, yourself. Why not focus on the elevator boy or the senior partner, then seat yourself at your type-writer and let the most intelligent of the two draw the slide, uncap and cap the lens for you. I require this for your next lesson.

Yours cordially, S. A.

NEW YORK, September 29, 1888.

To S. A.,—I really couldn’t send you a picture of myself. Yours,

B. JOHNES.

FAR-AND-NEAR, September 30, 1888.

To B. JOHNES,—Why not?

Yours urgently, S. A.

NEW YORK, October 1, 1888.

To S. A.,—Certainly I will not send my picture to a stranger.

Yours, B. JONES.

FAR-AND-NEAR, October 2, 1888.

To B. JONES :

DEAR FRIEND,—I am so sorry to have offended you. Why can't you send me your picture? Were you as homely as possible I should not like you less for a photographic pupil, indeed I should not. I should not like you less in any case, and besides I have taken your fee and must teach you until the end of the year, even if I did not like you. Remember I expect obedience from pupils.

Yours, S. A.

NEW YORK, October 3, 1888.

To S. A.,—I return your letter unopened and unread. I don't care a pin for the fee I have paid you—and I care less whether or not you like me—but as it happens, I am not considered homely.

Yours, B. JONES.

FAR-AND-NEAR, November 3, 1888.

To B. JONES,—I have waited a month to hear from you. Don't be foolishly angry about nothing. What have you been doing with your camera?

Respectfully, S. A.

NEW YORK, December 3, 1888.

To S. A.,—I have waited to get in a better humor with myself. Forgive my rudeness, please. I like your letters and hope you like mine. Our's was only a school-girl quarrel after all.

Yours, B. JONES.

FAR-AND-NEAR, December 4, 1888.

To B. JONES,—You did keep me waiting a doleful time, and all for nothing, as far as I can see. However, your letter makes me very happy. Do I like your letters? Faith and I do! and I like you, too! I like you better than your letters, and I think you the nicest fellow I ever knew—forgive the familiarity. Now when will you send your picture?

Yours most truly, S. A.

NEW YORK, December 10, 1888.

To S. A.,—I am ready to send myself to you the minute you send yourself to me—no sooner, no later! How your words cheer me! I am so lonely here in New York. I have no friends at all; but you like me, you say. Why, I love you; really and truly I do. The days are too dark and short for photography, but life is brightened with thoughts of you, and I think of you all the time. Don't you love me?

Yours, B. JONES.

FAR-AND-NEAR, December 12, 1888.

To B. JONES :

DEAR PUPIL,—You write to me quite like a girl, and to tell the truth your enthusiasm warms me up. I must see you—I must see your picture. I never said "I love you" to anybody yet, but, bless my soul, there is something fetching about your letters. I am half afraid you will be disillusioned when you see

me, and that will never do, for I could end my days in your company. Shall I come to town to you? Have you time to see
Yours devotedly, S. A.

NEW YORK, December 16, 1888.

To S. A.,—I feel like a girl when I get your nice letters, and the fun I get out of photography makes me young again—ever so young. I have not told you before, but I have given up birthdays—have had my full share and have lived them all down. I am twenty-three! Let us agree to exchange pictures before we meet, and each shall look at the other's at the identical moment—say on Christmas Eve. Good-by, good friend, and good night. I love you, altho' I have never seen your face.

Always lovingly, B. JOHNES.

FAR-AND-NEAR, December 17, 1888.

To B. JOHNES,—You are capital and so warm-hearted. Now, let us exchange spirit-pictures instead of Christmas cards. Soak a hypo-print of yourself in corrosive sublimate and send it to me, and I will do the same for you. Then on Christmas Eve we will each put the bleached sheet in a hypo wet blotter, warm it with the hand, count ten, and, presto! the picture comes back, and I see how you look and you see how I look.

Yours, S. A.

NEW YORK, December 19, 1888.

To S. A.,—Agreed!

B. JOHNES.

[These last two letters crossed.]

NEW YORK, Christmas Day.

To S. A.:

DEAR SIR,—I thought you were a girl! How dishonorable not to tell me at the beginning of our correspondence. Be man enough to burn my letters and never attempt to see me or write to me again.

Yours, B. JOHNES.

P.S.—If you have a side in rebuttal for the way you have deceived me, let me know. I can never describe my shame and surprise when, on removing your spirit-picture from the blotter, I saw you were a man. I suppose it is not your fault.

FAR-AND-NEAR, Christmas Day.

MY DEAR MISS JOHNES,—I would call you Bella if I were sure your initial letter did not stand for Bertha or Blanche or Beatrice or Bessie. It does not matter in the least. I never suspected why you fascinated me so, till I saw your face come up out of nothing in the blotting book.

I thought you were a man, but, oh! I am so glad you are not! Oh, my dearest! that little black inch of curly bang gave me the first hint, but I feared it might be a boy's face till your sweet smile and lace collar came out so clear and sharp. It is the most delicious thing that ever happened to mortal man since Orlando's time!

I know you made the same mistake about me, but never mind; everything is reversed on the ground glass. You've not said a word too much, for it's leap-year, don't you know?

I take the 9.30 A.M. train to town to-morrow, just to wish you a merry Christmas and many happy New Years by my side, for you are my pupil, and my school gives no vacations.

Yours for ever, S. A.

OUR ILLUSTRATION.

WITH the advent of the new year, 1889, and the beginning of a new volume of the BULLETIN, we cannot do better than present our readers with one of the most interesting photographic pictures that it has been our good fortune to secure for a long time. Photographs of the moon have been made before, but they were only about two inches in diameter; that is, this was the size of the best negatives taken by Dr. Draper and others. But here we have a print from the original negative taken in the great Lick telescope in California, and over five inches in diameter. The wonderful definition in the pictures, due to the great accuracy of the lens of the telescope, and the careful development of the plates by Professor Burnham, makes them the most interesting pictures of the moon ever produced by photography. The preservation of this fine detail has been very admirably secured by the use of Anthony's Aristotype paper, which gives better prints than albumen paper when used for such negatives.

The first glimpse of some silver prints kindly sent us last September by Professor Burnham, showed that he had obtained some most remarkable negatives. We at once telegraphed him to let us have the originals, if possible, and he very kindly sent them on. Since that time we have had to contend with some of the worst weather for photographic printing that has fallen to the lot of New York photographers for many years. This has been the cause of the delay in presenting these pictures to the readers of the BULLETIN until the present time. For we were especially anxious that such beautiful negatives should have equally good positives.

In sending on the negatives Professor Burnham very kindly gives the following notes upon their production:

"There is little to say from a photographic standpoint about astronomical photography. The same methods properly employed elsewhere can be used here, and the same precautions are necessary to obtain the best result. The 36-inch objective of the Lick telescope is simply a colossal camera lens with a focus of about forty-seven feet. There is this difference, however, in the use of the larger lens, that a small angle, ordinarily only one or two degrees, and in the case of the moon about half a degree, are used, while with the common rectilinear lens the plate embraces an angle of forty degrees and upwards. Hence, stops are not necessary to produce a sharp picture with the astronomical objective, as they would be if a plate were used proportional to its focal length.

"The pictures of the moon were made on 8 x 10 plates, the Seed, No. 26, being generally used, in fact exclusively, as long as they lasted. It was found that they made cleaner, better and generally more perfect negatives than any other plates which were tried. So far as the moon is concerned, a fast plate is unnecessary. As the time of exposure could not conveniently be made less than half a second, it was found necessary to reduce the equivalent time by cutting down the aperture, and nearly all the negatives were made with the aperture contracted to twelve or eight inches. Larger stops of sixteen, nineteen and twenty-three inches were tried, but it was found difficult under ordinary conditions to avoid over-timing. The plates were developed as I would develop any ordinary landscape picture. The same conditions are found in the one case as in the other. The pyro and carbonate of soda developer, which I have used for several years for developing all negatives and positives for the lantern, was used here. This formula was originally given by Professor Garrison, and is substantially the same as that

now recommended by the Seed Company. The exposures were made by drawing and returning as quickly as possible a light pasteboard slide working in front of the plate-holder, the slide of which had been previously drawn. The telescope was of course being carried by the driving-clock.

"Photographs of the stars, which require an exposure of from fifteen minutes to an hour or more, will be undertaken as soon as the telescope can be made to move with so little friction as to allow the clock to carry it steadily for the time necessary to get stars of the lower magnitudes. When this is done, we shall probably be able to reach farther out into space than has ever before been done."

OUR LAST ILLUSTRATION.

IN our hurry to prepare the pictures of Mr. Edward Anthony, we unfortunately omitted to mention the fact that they were produced from negatives made by Mr. Louis Alman, of Fifth avenue, New York, and among the best ever made of Mr. Anthony. The prints were made by Mr. E. Bierstadt, of Reade street, New York, by his beautiful Artotype Process.

OBITUARY.

MAURICE N. MILLER.

THIS well-known photographic worker died on December 8th last, after a very short illness. It is hard to realize that he is no longer with us, he looked the picture of health and vigor.

Dr. Miller was born at Keene, N. H., in the year 1838. His early education was at Leeland Academy. His first photographic work was with Howe, of Brattleboro, Vt. About this time he took up the study of medicine under Dr. Blakely, and graduated at Philadelphia as M.D. at twenty-one years of age. During the war he served as surgeon to a Pennsylvannia regiment, and afterward came to New York, where he assisted Professor J. W. Arnold at the physiological laboratory of the University of the City of New York. He held this position until the Loomis laboratory was built, and was then appointed instructor in microscopy, a position he held until his death.

Dr. Miller was noted for his skillful handling of tools. The readers of the "International Annual of Photography" will probably remember his excellent articles upon "Zincography." In this he made the original drawings from which the cuts were photographed, and these were among the best in the book. His lucid and interesting descriptions of the various processes are beyond question the best ever written upon the subject. Those who read this essay in the "Annual" will have an idea of the exactness with which his whole life's work was carried on. Among his students and associates at the University he had a name honored among men, and photography has lost a devotee whose place will not readily be filled.

ANTHONY'S PHOTOGRAPHIC BULLETIN, edited by Professor Charles F. Chandler, Ph.D., LL.D., is always bright and newsy. To the photographer, whether amateur or professional, it has become an absolute necessity.—*Geyer's Stationer.*

Thus photography, which at first was regarded as a simple toy to gratify idle curiosity, now employs its hundreds of thousands who depend upon it for a support—while at the same time it furnishes a most fascinating recreation to men of culture and refinement, and serves as a developer of intellectual power, mechanical ingenuity and chemical skill.

The Chairman further said: Before calling upon Mr. Cusachs for his contribution in the way of free-hand drawings, it will be well, perhaps, to examine the examples so kindly furnished for our instruction and kindly criticism.

The first are those of Mr. Gutekuntz, of Philadelphia. They consist of portraits, and the exterior and interior of noted churches.

The second are those made by the Moss Engraving Company, and comprise a great variety of subjects.

The third are those of Mr. C. C. Wright, and consist of etchings of the very finest quality.

The fourth and last, though not least, are examples of photogravure by the Edwards process.

These examples of four different processes will give a pretty definite idea of how books and papers may be illustrated at a comparatively small cost, while at the same time it will enable us to better judge of the fitness of each of these processes in the multitudinous uses of illustrative art.

The examples of the above named processes were presented in the order above named by the Chairman, and each process came in for its share of criticism and praise; the latter being decidedly more emphatic than the former. There was also manifested a conscious pride on the part of some of the photo. critics and eulogists that their art was capable of a development that would ultimately drive all self-conceited pretenders to high art into fields of labor to which they were better adapted, while at the same time it would only inspire the true artist with more lofty ideals, and the means by which he could more fully realize them.

Mr. BOGARDUS said: "I believe the idea of making sun pictures useful in illustrating works of art dates back to the earliest days of the daguerreotype process. From those days to the present hour this ideal has been constantly in the minds of the fraternity, and experiments without number have been made to reach this goal. Many have failed in their efforts. Much time and money have been expended, with little or no returns. The best

energies of many a skillful photographer have been wasted, and yet, out of all these disappointments and perplexities have come a success that the photographer may well be proud of; for it not only enlarges greatly the field of his labors, but ensures him a more reliable means of support."

The Chairman now introduced

Mr. P. G. CUSACHS, who after making some preliminary remarks concerning free-hand drawing, and how it was connected with photography in illustrating the daily and weekly papers, said: "The free-hand drawings I refer to are usually simple outlines of photo. views or portraits. These drawings pass into the hands of the photographer, and negatives are made from them. They are then etched and made ready for the press. As Mr. Gardner has said in his introductory remarks, all this is done in two hours time. Never in all the past history of art has there been such rapid methods of illustrating every conceivable subject, and thus translating it into a language familiar to both savage and civilized nations. Perhaps none of our leading monthlies, or even our daily and weekly papers, could maintain their present reputation without indulging thus freely in this universal language. In this language, however, there is much to be read between the lines; and hence, he who knows nothing of the art of drawing, often loses much of its significance and power to please. Without further prelude, then, I think you will readily perceive how photography may be advanced by the study and practice of the fundamental principles of art. Now, gentlemen, if any of you imagine I came here to teach you how to use some new and valuable photographic formulas I fear the chalk-talk I propose to give will appear in your judgment quite irrelevant; and you will be right, providing there is no relation between photography and the laws of art. In my judgment both science and art are intimately connected with our profession, and the study of either the one or the other cannot fail to make your work the more deserving of commendation.

"Without further words then, I will chalk upon the board a variety of illustrations, some of which you may some day be called upon to photograph from real life; and if they serve only at present as a pleasing pastime, they may at some future time aid your chemical skill in converting them into gold."

The marvelous skill and dexterity Mr. Cusachs exhibited in his free-hand sketches at once attracted the attention of his auditors,

which he successfully held for more than an hour, and until he had completed the work he had previously marked out for the evening's entertainment.

The Section then adjourned.

COLUMBUS CAMERA CLUB.

Room 40, Pioneer Block, Columbus, O.

DECEMBER 21, 1888.

THE first annual meeting of The Columbus Camera Club was called to order Thursday December 20th, at 8 P. M., with *President* LINCOLN in the chair and thirteen members present. The application for membership of Mr. S. C. Bradford was favorably reported by the Executive Committee, and he was elected by ballot. After the reading of an unusually large number of communications, a vote of thanks was passed to the publishers of Anthony's Photographic BULLETIN for kindnesses shown during the pass year, also to the Society of Amateur Photographers of New York for reports of their proceedings.

The annual report of the Secretary and Treasurer was read, showing a steady development and advance during the past year, in finances, membership and usefulness. The President's report followed. It was a clear, concise summary of the progress of the club, with a number of pertinent suggestions for future consideration, the chief of which were: Separation of the offices of Secretary and Treasurer; increase of dues from \$6 to \$8 per year, with quarterly instead of monthly payments; addition to the library of certain standard works on photography.

After the close of the President's report, it was moved and seconded "That the offices of Secretary and Treasurer be separated." Motion carried.

The election of officers for the ensuing year resulted as follows: *President*, REV. G. LINCOLN; *Vice-President*, GEORGE L. GRAHAM; *Secretary* F. H. HOWE; *Treasurer*, J. N. BRADFORD.

Executive Committee: G. W. Lincoln, George L. Graham, F. H. Howe, J. N. Bradford, W. H. Miller, John Field. *Membership Committee*: John Field and George L. Graham. *House Committee*: J. N. Bradford and F. H. Howe.

A short lantern exhibition was given after the election, slides being furnished by Messrs. W. H. Miller, F. H. Howe and J. N. Bradford.

FRANK H. HOWE,
Secretary.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, DECEMBER 11, 1888.

(Continued.)

The *President*—In addition to this donation, there have been sent four framed prints of her own work, by Miss Catherine Weed Barnes, one of our members. Mr. Thomas McCollin, of Philadelphia, has sent us a magnesium flash lamp. Mr. E. P. Griswold has sent us his book entitled "The Photographer's Book of Practical Formula."

A vote of thanks was then tendered to the donors.

The *President* announced that the programme for the January meeting had been partly made out, including a paper on "The Detective Camera and How to Use It," with an exhibition of many different cameras, and a report of the Chemical Committee on two or three subjects not yet announced.

Attention was called to the incandescent Welsbach gas burners with which the rooms of the society had been furnished.

After Mr. Osborne's paper there will be an exhibition of some lenses sent by Benjamin French & Co., of Voigtlander & Sons' make, two gotten up on a new principle. They are landscape lenses, and they are said to possess certain very excellent qualities.

Dr. Higgins has brought with him this evening a new detective camera that he will, I believe, kindly show.

Now I come to Mr. J. W. Osborne's paper. Mr. Osborne is well known in the history of photography all over the world, and is the inventor of Osborne's photo-lithographic process, which is in use now universally, and was the foundation of very many of the photo-mechanical processes, and therefore his researches are entitled to a great deal of consideration. (See page 752.)

We will now show some of the work of these Voigtlander lenses which I was speaking of. Mr. Duffield will start on the rounds some samples of the work done by the Euryscope and Voigtlander single landscape lenses.

Mr. NEWTON—Are they single combinations?

The *President*—It is an achromatic single combination lens, capable of instantaneous work.

There are also some samples of the matt and leatherized salted papers, manufactured by Mr. John R. Clemons, of Philadelphia. They are very well known among professionals, and ought to be known here among the amateurs. These samples Mr. Duffield will show you. They have been sent in response to his request, and I think you will find them very interesting. They are very artistic, having a softness and agreeable tone not ordinarily observed in the regular albumen paper.

(To be continued.)

Bibliography.

PHOTOGRAPHIC MOSAICS for 1889. New York: Edward L. Wilson.

This ever-welcome little annual is again on our table with its rich freight of practical hints and suggestions. This year it has several excellent photo-mechanical prints by the Mosstype, Levytype and Albertype processes. As usual the matter condensed into its 144 pages is progressive and useful, from the pens of a number of our best and most practical workers. We should like to give our readers a *resume* of the many good things and practical ones that we find in its pages, and we can only say, obtain a copy for yourselves and see how good it is. Many of the little hints that help you out of difficulties are worth many times the cost of such a volume.

THE BRITISH JOURNAL OF PHOTOGRAPHY ALMANAC FOR 1889. By J. Traill Taylor. London: Henry Greenwood & Co.

As usual, the massive volume edited by our good friend Taylor is a veritable storehouse of photographic lore. It has about 300 pages of articles by the best photographic writers of the day, and a host of valuable and suggestive notes and memoranda by its veteran editor. No photographer can afford to be without it if he wishes to keep up with the times. It is so moderate in price that we cannot conceive anyone too poor to obtain a copy, and the investment will repay him many times.

JAHRBUCH FÜR PHOTOGRAPHIE UND REPRODUKTIONSTECHNIK FÜR DAS JAHR 1889. By Dr. J. M. Eder. Halle a. S. Wilhelm Knapp.

This is the third yearly issue of this valuable German year-book; and those of our readers who are familiar with the German language should add this to their works of reference. It contains many valuable things not found in other annuals, and especially those that reflect the patient research of our German friends.

THE AMERICAN ANNUAL OF PHOTOGRAPHY FOR 1889. Edited by C. W. Canfield. New York: Scovill Manufacturing Co.

The third edition of this annual is now before us. It contains about one hundred articles from both American and European writers, mostly the former. These articles cover a little over 200 pages of large type, and are illustrated in many cases with cuts. The paper is good, and the printing is of fine quality. The full page illustrations are an improvement on former years.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—F. B. F. writes: I have tried the formula for making dry plates mentioned on page 589 of the "International Annual," and have had much trouble in flowing the plates. The emulsion is so thin that it runs off the plate. Please answer and let me know how much to use on a plate.

A.—You should read Dr. Eder's book on "Modern Dry Plates," issued by our publishers. The fault is probably due to using the wrong kind of gelatine. The details of the methods of working are too long for these columns.

Q.—A constant reader writes: Will you please answer through your valuable columns: 1st. What is the cause of the white spots on the enclosed prints? The formulas used, written on the backs of them. I used Anthony's R. S. paper, without fuming, as I had no ammonia at the time. The spots did not appear till dry, after washing. 2d. Is there such a thing as over-fixing for prints with bath 1 to 8; if left one hour will it injure prints? 3d. Does hypo deteriorate in the crystals? 4th. Can there be too much sulphite of soda in a developer; that is, would double the quantity injure the developer? 5th. Will chemicals keep better in the granular form than in the crystals?

A.—The prints you enclose have not been printed deep enough. Carry the printing to a point where the shadows are without detail; they will come out all right in the toning bath. You cannot use the ready sensitized paper without fuming. The paper now being made is the best we have ever seen; that is, the ready sensitized, if used with ammonia. The white spots will disappear if the paper is fumed well and printed deep. You will make prints brown and more likely to fade if you leave them in hypo too long; twenty minutes (bath, 1 in 8) is long enough. Hypo will deteriorate in crystals if the salt is kept in a warm place, not otherwise. We do not think granular form of chemicals assists their keeping qualities; we should say not. The sulphite in a developer does not exert much influence if there is much more than any given formula

calls for, unless it crystalizes out; then it becomes useless. But there should always be plenty of it.

Q.—W. B. C. writes: You will kindly favor me by answering the following questions through the BULLETIN: 1st. Give a good formula for a borax toning bath. I use a saturated solution of borax and gold chloride—enough to tone. I want a bright purple tone that will not change in fixing bath. Is there any known method by which the albumen can be taken off of the paper after the picture is toned and fixed? I received some time ago a sample of what was claimed to be the albumen stripped from the paper. If you can give me a method by which it can be done, it will be very valuable to me. Is it possible to make photographs and keep them from fading? If so, how can it be done? Please give me a formula for making porcelain pictures.

A.—Try the following borax toning bath:

A.

Borax.....1 gram— 100 grains.

Water.....25 c.c.— 10 ounces.

B.

Gold chloride 0.1 gram— 1 grain.

Water.....350.0 c.c.— 10 ounces.

Mix in equal parts just before use. We do not know a good method of stripping albumen prints. The films you saw were probably stripped from gelatine plates; such plates are made for this purpose for photo-mechanical printers. We do not know any silver prints that will not fade if made on albumen paper. Prints on plain paper are more permanent,

and platinum prints are the most permanent of all. For porcelain pictures use opal glass plates; these are made for that purpose and can be purchased.

Q.—H. C. K. writes: Will you please inform me what action acetate of soda has in a toning bath on a silver print? Please let me know through your next BULLETIN.

A.—When the bath is not too alkaline, it makes the prints tone brown. If a good excess of alkali is present it appears to have little effect.

Views Caught with the Drop Shutter.

As we go to press we receive a handsomely bound copy of the *St. Louis Photographer* for 1888. We tender our best thanks to Mrs. Fitzgibbon-Clark for her kind donation, which adorns our library.

MESSRS. MARCEAU & POWERS, the photographers of Indianapolis, have recently made some very handsome pictures of President-elect Harrison, making seventeen negatives of the General in a few seconds over five minutes. This is modern photography.

Mr. WILLIAM GARRISON REED, of Boston, has recently devised a set of gummed tickets, to be pasted on lantern slides so that they can be seen on the edge of the slide when it is in the storage box. This is a very neat idea, and we are indebted to Mr. Reed for kindly sending us a set. They are partially perforated and readily separated from the sheets they are printed on.

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Back of the House

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

JANUARY 26, 1889.

Vol. XX.—No. 2.

MAKING UP FORMULAS.

THERE are many things in photography that are suffering from lack of uniformity. Lens flanges are never made with the same threads for the same size lenses of different makers. American, English and other European dry plates are all made of sizes to suit the whims of some particular set of individuals without any regard to the tourist who has a camera made in one section of the globe and finds himself in need of plates in another. If the makers of other pieces of mechanism were as thoughtless about the wants of their customers as the makers of photographic cameras, lenses and plates, the advances in modern engineering would never have been made. But we think that the greater part of this confusion in things photographic is principally due to the photographers themselves; both the professional and amateur. For what is more bewildering than the hosts of formulas one sees in the photographic journals of to-day, the utterly reckless manner of naming the chemicals for use in them, and the confusion one gets into in trying to make up solutions for developers, baths, etc.

One writer will tell you to use hydroquinone, another hydrochinone, and a third, hydrokinone. With, perhaps, a limited knowledge of chemistry you go to the photographic merchant and ask for hydroquinone. A polite and well-meaning salesman hands you a bottle marked hydrochinone or hydrokinone and assures you it is the material you mean. This is perfectly true; but you have your doubts about it, carry home your purchase, develop a plate with it, and—fail. Now the first thing you do is to blame the salesman, believing he has given you the wrong material, when the real trouble is with yourself, and the wretched doubt produced in your mind by that label which does not correspond to the name given in the formula you wish to use. As a matter of fact, hydroquinone is the English equivalent of the German words hydrochinone or hydrokinone. These latter should never be used in English, and the manufacturers should be more careful about the labels they put upon the bottles.

Again, the writer of a formula tells you to use sulphite of soda. You again proceed to buy the material for use, and the first question you are asked is: Crystals or granulated? Thinking you have not carefully read the formula you hesitate to make the purchase, and return home to find yourself still in doubt, because the author of the formula fails to tell you which he means. The fact of the matter is, that the granulated sulphite is very much stronger in true

sulphite of soda than the crystals; and very often formulas are given in which, if you use the granulated salt, you would find it impossible to dissolve the quantities specified. As a matter of fact, the crystalized salt contains fifty per cent. of water, while the granulated salt contains none. The same argument is true of carbonate of soda. In this latter salt we have about sixty-three per cent. of water in the crystals, while the granulated variety contains about fourteen per cent.

In the case of potassium carbonate, we have no such difficulties as those mentioned above as occurring in the case of sodium sulphite and carbonate. The potassium carbonate usually occurs in commerce as a powder, free from water. Occasionally a crystalline variety is seen that contains about eleven per cent. of water; but this salt is not often found for sale.

The true and only way out of this confusion is to use the hydrometer for making up solutions for developers. This has already been adopted by some of our dry plate makers in the printed formulas given in their plate boxes. If you tell a man to take a given number of parts of a solution of a given degree of density on a Beaumé's hydrometer, he is much more likely to get it right than if you tell him to take so many ounces of a salt without specifying the condition of the salt.

Indeed, it has for a long time been a wonder to us that photographers will use a hydrometer to test their silver baths with, and entirely ignore its use in every other solution that they make up. Such an instrument should be their daily companion, and we are certain that it will cause less trouble and give more uniform working in the dark room than any other method that we know. For example: a saturated solution of carbonate of soda stands at 19 degrees Beaumé, and contains about thirty-nine per cent. of the crystals. A saturated solution of hyposulphite of soda stands at 40 degrees Beaumé, and contains about sixty-three per cent. of the crystals. These degrees of density on the Beaumé hydrometer are for the ordinary temperatures, 60 to 70 degrees F.

If the writers of formulas would only state how much of a solution of sodium carbonate or sulphite, of a given density, is to be used, the question of the use of the crystals or granulated salt would never come up, as the density of the solution depends upon that true salt present without regard to the amount of water it contains. Thus, to make a developer, it might be said:

Take—

Sodium carbonate, 10 degrees B.....	1 part.
Sodium sulphite, 10 degrees B.....	1 part.
Water.....	4 parts.
Pyrogallol	x per cent.

By this method the developer could be made up by adding two solutions of definite strength together, and any given quantity of pyrogallol could be added according to the volume of the mixture made up. Furthermore, any desired dilution of the developer could be very accurately stated by mentioning the degree Beaumé which the weaker solution should mark. Saturated solutions of any of the ordinary salts are not to be recommended; but any weaker solution, provided its density is known, could readily be used, and is far more easily made.

We hope we have said enough to induce the writers of formulas to state in more definite terms just what they mean. And if we could all agree upon the

use of the hydrometer, a much better understanding and far less trouble and failure with dry plates would be assured. We are compelled to believe that much of the trouble between the makers and users of dry plates would be overcome if solutions of definite strengths were recommended, and not a number of salts dissolved in one solution. If the salts are separated, the quantities of each could be much better regulated to suit different circumstances—changes of light, character of view, time of exposure, and many others. Under the present *regime* very little margin is given in most of the formulas, and in a great many all that can be done is to add more or less water.

Can we hope for more definite statements of formulas? With the increasing intelligence in the ranks of photographers we believe we can.

EDITORIAL NOTES.

OUR esteemed friend, Professor Dr. H. W. Vogel, in Berlin, recently celebrated his twenty-fifth anniversary as presiding officer of the *Verein zur Förderung der Photographie*, in Berlin; and on this occasion, being an extra festive gathering of all the members of the society and a good many friends and delegates from other societies, he was presented with an address, executed in a fine calligraphic style, encased in a portfolio of excellent workmanship. In this address particular mention was made of his extraordinary and highly meritorious exertions and indefatigable labor in the service of photography, and he was declared unanimously and forever honorary president of the society. We sincerely congratulate our talented correspondent upon the reception of such a marked approval of his labors by those who know him best, and regret that time and space did not permit us to join the many friends that showered upon him the praises he so well deserves.

THE Joint Exhibition Committee of the Philadelphia, Boston and New York Societies have announced that the third annual exhibition will be held in the Pennsylvania Academy of Fine Arts at Philadelphia, during the two weeks beginning April 8th next. Circulars, with full particulars, will appear later.

OUR good friend, C. D. Kirkland, of Cheyenne, Wyoming, sends us the following formula for a hydroquinone developer:

СОЛИДЫ Hydroquinone.....	1 ounce — 0.65 gram.
Sulphite soda (crystals).....	8 ounces — 5.23 grams.
Carbonate potash.....	16 “ — 10.46 “
Water.....	128 “ — 10.00 c.c.

With the above developer he has done some excellent work in instantaneous photography, as well as in transparencies and bromide paper.

THE annual election of the officers of the Lynn Camera Club was held at its meeting of January 1, 1889. The officers for the year 1889 are as follows:

President.....	W. H. DREW.
Vice-President.....	J. E. RANDALL.
Secretary.....	J. W. GIBBONEY.
Treasurer.....	E. F. BACHELLER.
Librarian.....	E. L. ROGERS.
Executive Committee for two years.....	W. H. RUSSELL.

A LEGAL decision in England involving the ownership of the negative, is of interest to every American photographer. A lady sat for her photograph to a certain company, and she afterward learned that the company were using the negative to make pictures for sale. She applied to the Courts for an injunction, which was granted, the judge giving the following reasons: "The object for which a photographer is employed and paid is to supply his customer with the required number of printed photographs of a given subject. For this purpose the negative is taken by the photographer on glass, and from this negative copies can be printed in much larger numbers than are generally required by the customer.

"The customer who sits for the negative thus puts the power of reproducing the object in the hands of the photographer, and in my opinion the photographer who uses the negative to produce other copies for his own use without authority is abusing the power confidentially placed in his hands merely for the purpose of supplying the customer.

"And further, I hold that the bargain between the customer and the photographer includes, by implication, an agreement that the prints taken from the negative are to be appropriated to the use of the customer only."

PROFESSOR CHARLES F. HIMES, the Acting President of Dickinson College, Carlisle, Penn., will lecture at the Franklin Institute in Philadelphia, on February 11th next, the subject being "Amateur Photography." We need not say that the subject will be well handled, Professor Himes being one of the earliest and most enthusiastic workers in amateur photography. Those who are located conveniently should hear this lecture.

THE Lowell Association of Amateur Photographers have reorganized under the name Lowell Camera Club, with the following officers: W. P. Atwood, *President*; Charles J. Glidden, *Vice-President*; George A. Nelson, *Secretary*; H. W. Barnes, *Treasurer*.

THROUGH the kindness of Mr. John Carbutt, the well-known dry plate maker, we have received a number of prints from negatives of interiors made on his new flexible films. They were made in the American Institute Hall, in New York, and are as fine as anything we have ever seen made upon glass negatives; with this important advantage, that they are practically free from halation.

THE following notice of our good friend Dr. Wilson appears in the "*Photographer's Almanach* for 1889," published by Liesegange, of Dusseldorf:

"To the readers of photographic works and journals, the name 'Wilson' is not unknown; the owner of this name has belonged, for the last quarter of a century, to the 'photographic general staff,' and our art owes to him many an advancement which has been made in that time. Especially does the ideal side of photography possess in him one of its most zealous and worthy representatives.

"The *Philadelphia Photographer*, founded in the year 1864, has been uninterruptedly edited by Wilson since that time, and always with great success; the magazine belongs undisputably to the foremost and most excellent of our art. The twenty-five thick yearly sets, standing upon the book-shelf, present an im-

posing spectacle. What diligence, what knowledge, what instruction is here stored up !

“Moreover, Wilson has written two instructive books on photography, which find large sale in America, and in consequence of this, call for frequent new editions. They bear eloquent testimony to the talent of the author. Also ‘Photographic Mosaics,’ which have been published since 1866 by Wilson—at first in conjunction with our friend, M. Carey-Lea—and which in form and contents resemble our almanach, are eagerly bought by the American photographers and amateurs. Wilson is at the same time his own publisher ; up to the year 1876 he conducted the business in connection with his partner, Benerman, after which it passed into his (Wilson’s) own possession.

“In the year 1869 we find Wilson a member of the expedition for the photographic observation of the solar eclipse, under the direction of Professor Morton, which took place at Iowa. In the year 1882 we find him again on a great oriental journey, from which he brought back rich and highly interesting material for lectures and projection representations.

“In acknowledgement of his service in investigation on the Orient, he was awarded, in the year 1884, by the Washington and Jefferson College (Pennsylvania), the degree of Doctor of Philosophy. In the year 1886 Wilson changed his residence from Philadelphia to New York. May he for many years yet work successfully among the best of the photographic savants!”

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

A Quick Printing Process—Results with the New Optical Glass from Jena—Concentrated Hydroquinone Developer—Influence of the Developer on the Color of Prints—Caustic Potash in the Developer.

MANY times I have heard professional photographers ask the question : “What can I do to furnish in two days 1,000 prints from one negative?” If I reply : Take bromide of silver paper—the answer will certainly be : “That gives black pictures, but I want them brown like regular photographs.” Well, this could be very easily accomplished with the aid of Lichtdruck (cottage type). But good cottotypes are not to be had everywhere. We have now a process admitting very well the solution of the problem, and which can be executed by every skilful photographer. It is nothing more or less but the use of chloride of silver gelatine paper. This paper has been known for years, but has met with less favor than it deserves. By way of a test I gave director Helff, in Judenburg, an order to develop 1,000 copies upon chloride of silver gelatine paper.

Mr. Helff writes : “The copies you sent me were printed in the hand copying apparatus (Patent Schlotterhaus) on roll paper, in diffused daylight, seven seconds. Total, time two and one-half hours.”

The rolls were cut in strips of four pictures each; duration two hours ; they were then developed with oxalate of potassium, 3 ; sulphate of iron, 1 (saturated solutions) ; diluted with some quantity of water, and with moderate addition of bromide of potassium.

The developer keeps from fourteen days to one month. Four strips of four pictures each were worked at one time. Time, three minutes; therefore total duration of development for one hundred pictures, about four hours. After this they were well washed and fixed two minutes in lots of forty; therefore altogether,

one hour. After this they were washed for two hours in repeated changes of water.

The toning was done with twenty copies at a time in the sulphocyanide gold bath. It was finished in about four hours. After this the pictures were washed for one minute and put into the alum bath, together about one hour. This was followed finally by washing, squeegeeing upon glass with a rubber roller, and drying by artificial heat (two hours). During the summer season this is done best in the open air in sunshine.

The squeegeeing requires about four hours for 1,000 copies. This time is calculated for one person; with extra help the time can be reduced to one-half.

The tone is according to one's pleasure, but it is difficult to obtain perfect equality in large quantities, because the intensity of daylight changes during printing. This is no hindrance for practical purposes.

The pictures are trimmed with the glass pattern. The mounting requires practice and care. Glue is spread in the middle of the card-board (very little, to prevent it from running out on the sides), and the picture is placed on a large glass plate and glued on the edges; but great care has to be taken that the glue does not touch the picture side. In mounting, the glued parts of picture and card-board will meet.

Each picture is laid upon a fresh part of the glass plate, and when this is full another one is taken; the first one used can be cleaned and dried in the meantime. With a little practice and working in concert, 150 pictures can be mounted in an hour by two persons, without injuring the glass in the least. The material used for pasting has to be a pretty thin glue. The pressing on to the card-board has to be done with a rubber roller. After drying, the picture is burnished (cold). Retouching is done from color with gum arabic.

Since the establishment of the new factory of optical glass of Schott & Co., in Jena, a change is coming in practical optics; therefore, also in the production of photographic objectives. Until now all opticians of the world were obliged to procure their glass from Paris and Manchester. Unfortunately, these were not always uniform, and the lens calculations made for one lot would not always agree with those for the next shipment. This has ceased now. The glass factory in Jena is under a scientific management, and one fusion is exactly like the other. The opticians do not require any more to remodel their polishing trays for each new shipment, and the glass furnished is of such uniform proportions, not thought of as attainable in former times.

Our first-class opticians, Voigtlander, in Bromswig, and Steinheil, in Munich, are occupied with testing the new glass, assisted by two scientists of the Imperial Physical Institute, Dr. Lummer and Dr. Kaempfer. The first result of their activity I obtained recently from Voigtlander, in the shape of two euryscopes of exactly the same focal distance. The difference was surprising. With full opening the one will cover a visual field of 15 cm., completely sharp, whereas the other will cover only 11 cm. This is of great importance for portraits and instantaneous views. The luminous circle of the new objectives was also about 4 cm. larger than that of the old ones. This is of great significance for the production of wide angle lenses.

The results obtained characterize sufficiently the progress which has been made with the new glass of Jena.

The movement in favor of the hydroquinone developer proceeds quietly.

My son made the observation recently, how, with different mixtures of hydroquinone, with carbonate of potassium or sodium, the color of the paper pictures (bromide of silver paper) made with the same can be considerably influenced. This color depends upon the quantity and the kind of the salt added. If the developer is made according to the following formula :

Sulphite of soda (crystals).....	40 grams.
Hydroquinone.....	5 “
Carbonate soda (crystals).....	50-150 “
Water.....	900 c.c.

Green pictures will always be obtained up to 75 grams carbonate of soda. At a larger soda proportion the tone will gradually improve to black or brownish-black.

With 75 grams of carbonate of soda and correct exposures good results can be obtained, but not with over-exposure.

Carbonate of potassium has the great advantage over soda, that the pictures will never have a green tone, and it is therefore decidedly to be preferred for the development of paper pictures.

My son composes the developer as follows :

Sulphite of soda (crystals).....	40 grams.
Hydroquinone.....	5 “
Water.....	150 cc.

After everything has dissolved (if necessary, by putting the bottle in hot water) 50 to 54 grams of carbonate of potassium are added. A larger quantity of carbonate of potassium will easily cause strong formation of bubbles during development, particularly in hot weather. For use 5 c.c. are diluted with water to 30 c.c.

This concentrated developer keeps a very long time (in diluted condition only two to three weeks) and can be recommended particularly for traveling. In the development of gelatine plates I obtained with the same also very good results; it might also be recommended for instantaneous views, producing a great many details and causing a very rapid development.

For the negative process I prefer in most cases the soda developer. On account of its greater durability it can also be kept in the following concentrated form:

Sulphite of soda (crystals)	40 grams.
Hydroquinone	5 “
Carbonate soda (crystals).....	75 “
Water.....	200 c.c.

For use, dilute 10 c.c. with water to 35 c.c.

Both developers can be graded according to the character of the plates to be developed or the desired result; for too hard working plates less water is used for the developer and more water for soft working plates.

The price of the hydroquinone developer might prove to be considerably cheaper in the form mentioned (even if used for one development only) than that of the pyrogallic developer.

Several authors recommend an addition of caustic potassium or caustic soda. I do not feel much inspired about it. True enough, it accelerates development, but it causes slippery hands and easily gives cause to frilling, particularly in the summer. I remark, besides, that the development with carbonate of potassium and correctly exposed plates has a duration of only two to three minutes.

ENGLISH NOTES.

ONE by one the pioneers of photography are dropping away from us. The death of Edward Anthony came as a surprise and a shock to many in England, who either loved him as a personal friend, or who respected him as a man who had done much for photography, and as the head of a firm whose name is known wherever photography is practiced.

I was greatly pleased to hear of the action of a section of American photographers, who, a short time back, commemorated the services of H. T. Anthony by causing a bronze tablet to his memory to be placed where many would see it; but this solitary fact only causes me to think that both in England and America we have been somewhat neglectful of the "mighty men of old." France has honored Niepcé with a statue and Daguerre with a bust; but our Talbot and Herschel, and your Draper and Morse—not to mention other great workers—still wait for a proper recognition of what they did when they laid the foundations of photography. Is there not work here for our conventions, our societies and our clubs?

But to turn to more practical topics. Among developers hydroquinone is again coming strongly to the front, and my own recent trials of it have shown that when combined with hydrate of sodium (caustic soda) it is an exceedingly powerful and clear developer, working well with either paper or plates. The formula I prefer is as follows:

A.

Sodium hydrate.....	8 grains.
Water.....	1 ounce.

The sodium hydrate is sold in small white sticks; it dissolves very readily in water.

B.

Hydroquinone.....	8 grains.
Sulphite of soda.....	40 "
Citrate acid.....	2 "
Water.....	1 ounce.

C.

A ten per cent. solution of potassium bromide.

Use equal parts of A and B, and add to each ounce of the mixture 5 drops of C.

All these solutions keep well, so that a pint or more of each may be prepared at once. The mixed developer will serve for many plates, in fact until quite used up, if it be strengthened occasionally with more of the original solutions. After developing several plates I have kept the mixture till the next morning, and found it even then almost colorless and quite active. A great complaint against hydroquinone has been its slowness; but the caustic soda quickens it remarkably.

In cold weather, or for instantaneous work, the potassium bromide may be omitted.

It is a great advantage, however, to keep the solution used in development as near as possible to the temperature of 60 degrees F. This can be done by using ice in summer and hot water in winter. If distilled water be also used,

as it always should be, in making up the developer, the whole thing becomes as uniform and easy as possible.

For those who have artistic tastes and powers I can recommend a capital plan for using up dry plates which have been spoiled by accidental exposure to daylight; or any ordinary plate may be used with or without a short exposure to white light and immersion for a few minutes in a weak developer, followed, of course, by washing and drying, but omitting the fixing in hypo. Get an etching needle or manufacture a substitute by firmly binding a stout needle to a penholder and proceed to draw upon the surface of the film, using the needle-like pencil, but causing the point at each stroke to cut right through the film. The point of the needle must be ground flat, so as to act like a cutting and not a scraping point. A sharp blade of a penknife, or better, a surgeon's lancet or scalpel answers extremely well. If desired, the dry plate (a thinly coated one should be chosen) may be used like one of the ground glass "drawing slates" we see in the toy-shops, being laid upon the design which it is desired to copy and the lines cut through the film with the needle-point. So far as I remember, I first saw this method in print in a little book published by Strudwick in 1858, but this Christmas an artist-friend of mine has produced some excellent effects in this way. His drawings have all the effect of a fine etching. Of course any number of copies can be obtained by simply using the "etched plate" as a negative and printing from it in the ordinary way. If you have some power with the pencil try this method; print on bromide paper and your friends will find it difficult to guess how the results have been obtained until you "explain." The process has no name that I know of, and I don't find it easy to think of a good one. Perhaps "Etchotype" might answer.

The introduction of the new "flexible film," or celluloid dry plate, reminds me of an attempt to introduce what was practically the same substance twenty years ago. In the *British Journal of Photography* for 1869 (see page 155) we are told that the name "Parkesine" is applied to a remarkable substance discovered by Mr. Alexander Parkes some two or three years ago. The mode of preparation is exceedingly simple. Ordinary pyroxyline is dissolved either in a mixture of ether and alcohol, nitro-benzole, or some other suitable solvent. With this solution Mr. Parkes combines castor or cotton-seed oil. The combination of the oil and the pyroxyline on evaporation gives rise to a substance which is as hard and flexible as ivory, and is stated to be neither softened by heat nor hardened by cold. It can be obtained perfectly transparent, and can be easily rolled into large plates; hence it would seem to be a peculiarly suitable substance for employment as a substitute for glass. The Parkesine plate might be substituted for the ordinary glass plate, and the former then coated with collodion, sensitized in the nitrate bath, and the positive printed, developed, fixed and dried just as in the ordinary process.

In the search for transparent substances as substitutes for glass, it seems curious that the claims of celluloid should have so long been forgotten. Possibly difficulties of manufacture intervened. All honor to Mr. Carbutt that he has achieved what, from all I hear, is a decided success. The trouble involved is the use of "stripping films," and the risks of damaging them are so great that I, for one, always print from such films "unstripped;" but a new transparent, non-brittle substitute for glass, which requires no special manipulation, is welcomed by

TALBOT ARCHER.

COLLODIO-BROMIDE EMULSIONS.

BY F. C. BEACH.

[Read before the Society of Amateur Photographers of New York.]

(Continued.)

My experience with the carbonate of ammonia developer was rather unsatisfactory. I mixed the solution according to Mr. Brooks' directions; it had a strong odor of ammonia, which I presumed was the alkali intended to bring out the picture, but somehow it failed, and it was only by great patience and perseverance that I succeeded at all. Mixing it as directed and pouring on and off the plate, it took at least five minutes before the faint show of an image appeared, and by constantly working over the plate I managed to secure a slide in about twenty minutes, somewhat over-dense in the shadows, which I regarded was due to too slow development.

I mixed up a half an ounce of dried carbonate of soda, not the ordinary crystals, in 10 ounces of water, and applied two or three drops to the same developer, when used on another plate, and to my gratification the image appeared rapidly, and acquired the requisite density and brilliancy in the time I thought it ought to. Remembering that I used to employ the soda on Mr. Newton's plates long ago, and meeting Dr. Higgins, who also advised it, I have ascertained that it is much better than ammonia, and puts the relation of exposure to developer on a solid basis. We have no fickle alkali like ammonia, but a certain fixed alkali which may be relied upon to act as you expect it should, every time. Mr. Newton advises using the pyro dry; I obtain just the same results in slide making by using it preserved in solution with sulphurous acid and sulphite of soda. It prevents the developer from getting muddy, which it is otherwise sure to do if you are compelled to prolong the development. I believe the only person suggesting the use of hydroquinone on these plates is Captain Abney, in his work on "Photography with Emulsions." I have tried it, and think if anything it works quicker than pyro, and produces equally as good results.

Therefore, for Brooks' emulsion, I can recommend the following developers:

STOCK SOLUTION NO. 1.

Carbonate sodium (dried).....	230 grains.
Sodium acetate.....	120 "
Potassium bromide.....	120 "
Water.....	10 ounces.

No. 2.

Sulphurous acid and sulphite soda, pyro solution, after my formula based on the strength of 48 grains of pyro to the ounce, or any other pyro solution based on the same strength.

To develop a slightly over-exposed plate, add 20 minims of the pyro No. 2 solution (and the same amount also of No. 1), then fill the graduate with water until the whole measures half an ounce.

You thus have a dilute developer to begin with. The image will appear in a few seconds (probably ten) after the developer is applied, and will be finished in about a minute, or perhaps three. Then the image is examined by transmitted light, and when the desired density is reached the developer is poured off and the plate washed under a gentle stream of water for a few seconds, just enough to clear it of the developer. If the water runs too strong, it is apt to split the film and carry it off the plate.

Then comes the fixing in less than half a minute with the cyanide, which is most rapid, leaving the high lights beautifully clear, and the dense portions exactly as you saw them before fixing. The cyanide is quickly washed out under the tap or by soaking the plate in water. In a few minutes the plate may be dried by heat over a lamp or near a stove, then varnished, and it is ready to mount. Here, there are two important advantages over gelatine, the non-overfixing out of the dark portions and the rapid drying. If the developer works slow and the image appears to be slightly under-exposed, simply add a few drops at a time, at short intervals, of the No. 1 solution, until the details appear sufficiently out.

I rather prefer the hydroquinone to the pyro, because it keeps better, and you

can use the same developer over again. It appears to give the plate equally as good a color as pyro.

I mix a solution as follows:

Hydroquinone, chemically pure.....	15 grains.
Sodium sulphite, chemically pure.....	40 "
Distilled water.....	1 ounce.

Put $1\frac{1}{2}$ drams of the above into the graduate, add 20 minims of the No. 1 or soda solution, and fill with water until it measures 4 drams, then apply to the plate.

This process is especially useful in making slides from negatives having thin skies; and when it is found that sky of a slide is veiled or fogged, it may be readily removed by the use of an alcoholic solution of iodine.

Mr. Brooks states that the solution should be prepared as follows:

Iodine.....	20 grains.
Alcohol.....	1 ounce.

Drop a few drops of the above into an ounce of water; if the solution should appear cloudy a little more water added will clear it; pour on and off the plate from a developing measure for a minute or so, and if one place seems more fogged than another, pour on and off that part; the high lights will assume an opalescent appearance. When this has taken place, wash well under the tap, and again pour over the cyanide solution. The image will then clear up and the fog will be removed from the high lights. This manipulation can be repeated until the desired effect is obtained.

If properly exposed and developed the slide should have a brown tone by transmitted light. Mr. Dunsterville gives the following for toning and strengthening, which I have not had time to try:

To tone the transparency take—

Platinum tetra-chloride.....	1 grain.
Nitric acid.....	1 minim.
Water.....	4 ounces.

And immerse the plate. Watch carefully, as the toning proceeds very rapidly. As soon as the wished-for color is produced, take the plate out at once and wash well and quickly. Should the toning have gone too far, the warm color may be restored by flowing again over the plate the alkaline developing solution and the toning done over again more carefully. Should the picture appear too thin after toning, it may easily be intensified to any degree by the following solution:

Pyrogallie acid.....	30 grains.
Citric acid.....	30 "
Alum.....	30 "
Distilled water.....	15 ounces.

To each dram of this add two or three drops of a 20-grain solution of silver nitrate.

Should the picture appear too dense after toning, it may be reduced by flowing again over it the cyanide fixing solution.

I may remark further that these plates can be developed with a weak ferrous oxalate developer, restrained with bromide of potassium, as easily as gelatine plates. I have been thus explicit as regards details in order that any amateur wishing to make these beautiful pictures may have a practical guide that is reliable, and I trust some of our members will try working the process.

It is well known that the perfection of the collodio-bromide process in this country was largely due to the exhaustive experiments carried on by Mr. Henry J. Newton, and I have deemed it but just to him and all American workers to include in this paper his formula for an unwashed collodio-bromide emulsion, as now given to me by Mr. O. G. Mason, of Bellevue Hospital, whom as some of you may know, is still using Mr. Newton's formula. The collodion is prepared as follows:

Alcohol.....	} Equal quantities.
Ether.....	

Pyroxyline (gun-cotton) 6 grains to each ounce of alcohol and ether used, compounded as follows :

Put the alcohol in a bottle of sufficient capacity, then add to each ounce 16 grains of bromide of cadmium; then add to each ounce 12 grains pyroxyline and lastly add as much pure concentrated sulphuric ether as alcohol used. Let the collodion thus made stand several days to ripen and settle.

To silver the emulsion, prepare for each ounce $12\frac{1}{2}$ grains nitrate of silver crystals by pulverizing in a mortar, put it in a flask or bottle, and add for each 2 grains of silver, one drop of water, and apply gentle heat, preferably over a water bath, until dissolved.

Then add to this dissolved silver, four drops nitric acid for each ounce of emulsion to be made, and while the mixture is yet warm, not over 100 degrees F., add to it the proper amount of bromized collodion, as previously given. Let the whole stand six hours, then add to each ounce of bromized and silvered emulsion 1 grain of tannic acid.

At the expiration of six hours (for clear, brilliant work, or twelve to eighteen hours for a more sensitive plate), after adding the tannic acid, add for each ounce of emulsion 3 grains of finely pulverized chloride of calcium, and shake the mixture until the calcium is dissolved.

The emulsion improves by age and frequent shaking. He says nothing about the developer, but I presume he employs the soda and pyro developer always recommended by Mr. Newton.

(To be continued.)

THE LIGHTING IN PHOTOGRAPHIC STUDIOS.

BY P. C. DUCHOCHOIS.

(Continued.)

X.

Le regard est un reflet de l'âme; it expresses all our sensations, joy, sorrow, love or hatred. Rembrandt and Vandyke, Corregio and Titian, Reynolds and Gainsborough, all the artists as a rule direct it to the observer; the photographers as a rule turn it off, and thus deprive themselves of the most effective means to give character, life, expression to their models. Do you want an example amongst thousands? Look at the portrait of Mona Lisa—*la Jaconde*—by Leonardo de Vinci.

How simple and *reposé* is the attitude, but how graceful and noble also! The body slightly turned, the head almost full face, a drapery thrown on the shoulder, one arm and the hands resting on the arm-chair, and that is all. But that indefinable smile, her fascinating regard, full of promises, impress you with an enamored and trembling emotion, which can never be forgotten. Turn her eyes off and the charm which attracts you to the enchantress, as the magnet attracts the steel, is destroyed. This portrait has been engraved by good artists, and everyone has failed to render the expression of the beautiful Lisa; in fact it is impossible.

I know well that to direct the eyes to the observer—the lens in photography—is not always possible, for if we study the features of our model we observe that very often they are not symetrical; one eye is larger, the mouth slightly crooked, the nose not straight, etc. Hence the necessity to pose the sitter in the most advantageous manner to conceal these imperfections. But whenever it is possible, one should select an attitude so as to permit of directing the eyes to the lens without straining them much in the corners.

The old photographers strictly followed this rule ; there was consequently little difference in the direction of the head and body. This manner has been much criticised, but it was not the pose which was at fault, for this attitude imparts nobleness and grandeur to the picture, and is quite appropriate to the composition of a portrait, as seen in the works of Titian, Velasquez, Caracci and other masters. The fault was in the arrangement of the drapery and accessories, and in the lighting, of which they seem to have had no notion at all. "The three-quarters view of the head," says Burnet, "gives to the artist an opportunity of representing both sides, independent of which advantage it has a great variety of forms, and gives an opportunity for introducing breadth of light and shade." On the same subject the author of "Pictorial Effect in Photography" remarks : "However graceful a figure may appear, which has cost some effort to the sitter to attain, it does not compensate for the unaffected air and repose derived from the head and body placed in one direction."

We have said that the eyes should be lighted by one light only ; moreover it is a strict rule for the illumination of the whole figure, and therefore that there should be but one luminous spot or reflect.

This reflect, necessary to give life to the eyes, should be placed on the upper part, on the side of the source of light, nowhere else, and visible and equal in both eyes. Therefore the head of the model should be turned to the light just enough to produce that effect.*

In this position the head is quite well lighted, showing the classic illumination on the arc of the nose. The camera may be then placed to take whichever view is the most advantageous to the features of the face. Many artists follow this simple rule to place the model in the light, altering afterwards the illumination to produce relief by contrasts of light and dark.

All reflection from the walls,† the floor, curtains, which projects an actinic light in the eyes—not always apparent when viewing the model, but which will print white on the positive proof—should be avoided. If this rule be observed, as well as not to have any bare glass in front of the model, blue eyes can be photographed as well as dark ones ; moreover the pupils will then have no tendency to contract.

To direct the regard, the sitter should look at some object, placed in the obscured part of the studio, so much the larger as it is farther off ; at a distance of 14 feet it may be about 10 inches square.

If the regard be direct in the lens, the camera should be placed under a canopy projecting 15 to 18 inches outside. This arrangement, or any similar one, is also useful to shelter the lens from extraneous or reflected light in order to obtain clear negatives.

Lastly, the sitter should be instructed not to look steadily at a peculiar spot, but anywhere in that object, and to blink the eyes naturally during the time of exposure.

In all the examples of lighting given in the preceding pages, the reader must have observed that the light from above illuminates the model all over, casting deep shadows under the eyebrows, etc., whilst the side light softens these shadows, relieves the lights by stronger lights, and breaks the evenness of the lighting by

* A revolving platform is most convenient to pose the sitter in the light without it being troubled to move at all.

† They may be painted dead light brown or of a dark neutral color.

casting a shadow on the side of the model opposite to its direction. As a rule, the light from above should dominate.

In concluding, I will repeat what I have said often in the course of this essay: Study, again, always, not only the art of lighting—lights and shades are the colors of the photographer—but also the art of posing, both arts being dependent on each other.

“By studying the great masters of *chiaro-oscuro*,” says Opie, “you will by degrees become acquainted with all the artifices of contrasting light and shade to produce *relievo*; and joining light objects together and black objects together in massive order to give splendor and breadth of effect; of gradually sinking some effects wholly or partly in shadow and losing their outlines in the ground, to produce softness and harmony; and of making in other places abrupt transitions to produce vivacity and spirit.” These studies will equally teach you where to strengthen the lights and soften the shadows intelligently by retouching the negative without altering the anatomy of the head,* and how to improve and give vigor to the picture by light and dark formed by printing dodges.

Before studying by seeing the masters' works you should, however, learn the first principles, else you will surely be misled and your artistic education will be based on false judgments. Everyone should be well read in artistic literature if he wishes to become an artist or a critic deserving that name.

Every day you should spare time to experiment on lighting. All educated artists who practice the art of photography—for photography is an art, as you well understand now—never cease to study the lighting in the glass room, which presents more difficulties than it seems at first sight. The late Adam Salomon, who was a sculptor of talent and a photographer that very few have equalled, had “two life-sized figures dressed in black and trousers for his essays; and since he had here the contrasts of black drapery and white features, which is the plague of the photographer, he knew pretty well that if he could succeed with these he could succeed with live models.”

The most terrible foe of the photographer is human vanity. Everyone is quite satisfied that “he is well in any pose and by any light,” and forgets that the “brutality of the lens exceeds that of the most truthful mirror.” But we have a sure remedy for that impoliteness, and “that remedy is lighting.”

I do not mention retouching, by which one can resuscitate a man of eighty springs into a dude, because no photographer will compromise his dignity by resorting to such a meanness for the sake of money. Our portraits are true likenesses; we retouch slight imperfections, but never—*hardly ever*—to such an extent as to alter the features of the model, its age and characteristics.

Be careful to produce softer effects of light and shade on the sitter when working with short focus lenses, which more brilliantly illuminate the image by concentrating the light, and therefore produce more contrast than is seen in the studio.

Observe the inverse rule in using long focus lenses or diaphragms to better the definitions. Sharpness in this case is obtained at the expense of the illumination, the light being diffused at the focus of the lens.

Do not neglect, therefore, to study your optical apparatus nor your photochemical processes, the development specially.

* The anatomy of the head is best studied on a plaster cast, showing on one side the face as it appears in life and on the other the bare bones and muscles.

In the collodion wet process, the development proper has very little or no influence on the final result, the exposure being the only factor, although it is possible to diminish or increase the contrast by well-known means, but this is obtained by sacrificing some of the delicate details in the half lights and shadows.

Since the discovery of the gelatine process, that part of the photographic operation—*i. e.*, the development—being quite under control, has acquired a real importance; “it is an art by itself” and you may entirely spoil the lighting effects if you do not know how to regulate it. Indeed, the development of gelatine plates is a matter of very interesting and serious study. One can produce vigor or softness by its sole agency. However, it is advisable to rely entirely on the lighting in order to obtain brilliant effects and details in the shadows.

In your practice do not confine yourself to play the part of a copyist. By select reading, the study of nature and *seeing* masters’ works, which latter is a *conditio sine qua non*, you can acquire a taste of your own, a real original talent. There are assistants in Paris, as good artists as they are good photographers, who receive for their services as much as one thousand francs (\$200) per month, and that is very high wages in France. If you have not the *feu sacré*, do not be discouraged; study, experiment, for you will at last, guided by your artistic education, make pictures which will place you in a high rank amongst photographers.

(To be Continued.)

INFORMAL EXHIBITION OF PRINTS AT SOCIETY OF AMATEUR PHOTOGRAPHERS.

NOVEMBER 30 TO DECEMBER 19, 1888.

A VERY successful and interesting exhibition of prints, representing mostly the work of members of the Society, was held for nearly three weeks at the rooms, from November 30 to December 19, 1888, inclusive.

It had been gotten up on short notice, yet included quite a number of exhibitors, and covered all of the available wall space in both the main hall and library, numbering, it is estimated, five hundred and ninety different pictures, distributed among some forty exhibitors.

Commencing with the exhibits on the walls of the library, were nine 5 x 8 unframed landscapes, by Mr. J. B. Manning; he had also some very good portraits of a few young girls grouped in an ordinary room. Excellent work by Mr. C. C. Roumage, Jr., was shown in his 5 x 8 landscapes, of which there were eight.

Dr. J. T. Nagle had an extensive exhibit, covering forty-three pictures (thirty 4 x 5, thirteen 5 x 8). Those most striking embraced admirable cloud effects, marine views, boats in surf, excellent animal studies, his peculiar “Fish-hawk Nest Pictures,” and quite a good interior of the New York Morgue.

The work of Mr. J. E. Plimpton included fifty 4½ x 6½ photographs, illustrating a variety of interesting views of English scenery. One that was particularly artistic was of an old-fashioned wind-mill. All his work showed excellent taste and was much admired.

At the east end of the library was a fine collection of photographs, contributed by members of the “Historical Section,” and included the work of Messrs. Leaming, Duffield, Howell, Lawrence, Simpson, Benson, Plimpton and Newton. Among the views of interest were exteriors of the “Courtland Manor House,

built 1867," which at one time was used as a fort, and the interior of the haunted chamber and the dining-room with the loop-holes out of which muskets were fired at the Indians.

There was also a picture of "Washington's Headquarters," now located at the foot of Broad street, which he occupied at the time he took leave of the Continental Army.

Others were of the old University Building at Washington Square, by Mr. H. J. Newton; the "Jumel Mansion," formerly the residence of Aaron Burr; "The Rhinelander Sugar House," used as a prison during the Revolution; Old Stryker Mansion; "Apthorp Mansion," used as headquarters by the British general during the battle of Harlem Heights; "Hamilton Grange," built in 1792 by Gen. Alex. Hamilton, showing the thirteen gum trees planted by him to represent the thirteen States of the Union; "The Century House," built in 1736; also views of "Black Horse Tavern" and "Old Dutch Church" at Sleepy Hollow, New York. The collection represented historical subjects in and around New York.

On a separate screen at this end of the room were nineteen 4 x 5 excellent sepia platinotype views, illustrative of Norwegian scenery, made by Mr. Richard H. Lawrence last summer. The quality of the work was admirable and attracted considerable attention. He had five other larger platinotype pictures in frames, that were beautiful specimens of this process; that called "Canal in Lorches, France," was especially commended by the committee, also a view on the Saw Mill River, New York.

Beginning at the northeast corner of the main hall were hung thirteen frames, of 8 x 10 bromides of yachts and views of "Old Line-of-Battle Ships," by Arthur H. Clark, a member of the London Camera Club, loaned by Mr. M. Roosevelt Schuyler. They were beautifully done, well taken, finely located on the plate, and neatly mounted. His 17 x 20 enlargement of a yacht coming bow on in a stiff breeze, was particularly artistic and striking.

Mr. Schuyler had a finely lighted and well-posed theatrical group, entitled "Solomon and Miss Gerrish in 'The Yoeman of the Guard.'" There were also three other frames of interesting subjects.

Mr. H. J. Newton's five frames, embracing twenty $6\frac{1}{2}$ x $8\frac{1}{2}$ photographs, presented a very attractive exhibit. His Central Park sheep views were admirably done. The committee selected a picture of some cows grazing in an orchard as being one of his best.

An interesting feature of the exhibition was the work of the ladies. Mrs. David Williams had five pictures ($4\frac{1}{4}$ x $6\frac{1}{2}$) framed, and two unframed, those most admired being an enlargement of a "Dog's Head," and a girl dressed in white standing alongside shrubbery with the sunlight streaming through, partly striking the dress; the whole effect was very pleasing. Mrs. Nathan Appleton exhibited a frame of thirteen $4\frac{1}{4}$ x $6\frac{1}{2}$ attractive views in Switzerland, and had besides eleven others on the other side of the room, not framed, which included some excellent animal and portrait studies. The portrait of "Miss Emma Thursby" was especially good, while the "Angola Cat" photograph was particularly liked by the committee. Mrs. Arnold's work was very much admired, and included very pretty 8 x 10 road scenes, one especially interesting, showing sunlight effects, was entitled "Pollard Willows, Stockbridge, Mass." She also had two 4 x 5 views of Florida palm and Spanish moss trees that were quite

striking. Miss Catharine W. Barnes exhibited nine 8 x 10's, mostly of interiors of drawing-rooms, libraries and halls; they were most excellently done, and sustained her well-known reputation for careful and artistic work. She also had a portrait of a lady in wedding costume, admirably lighted and posed. She has kindly donated these pictures to the Society.

The Society never had before such a large exhibit of ladies' work, and it is very encouraging to note the taste and ability displayed in their exhibits; their enthusiasm for photography appears to be greater in proportion than that of other members.

Mr. David Williams had a notable exhibit, twenty-four framed $6\frac{1}{2} \times 8\frac{1}{2}$, and two unframed. Among those that were particularly striking was a "View on Lake George," a very clear view of an "Old House" along a roadside, a tree covered with snow (a very interesting picture), also views showing snow effects and results of last spring's blizzard; one that was specially good was that looking down Madison avenue just after the March blizzard. •

A frame of four 5 x 7 views by Mr. Z. T. Benson, illustrating Eatontown Ford, Eatontown, N. J., including a very artistic road scene (which appears to be Mr. Benson's specialty), and was made effective by the natural position of boys sitting on the fence in the foreground. Mr. Chas. Simpson had a frame entitled "Contrasts," showing residences of the rich and poor citizens of New York City. One 5 x 8 view of a "Mountain Cascade," was quite pretty, while his "Old Sam, a Norfolk Darkey," and "Girls Watching the Waves," were excellent character studies.

A series of ten 5 x 8 views, by Mr. J. Wells Champney, along Green River, Mass., were very well done.

Mr. John E. Dumont contributed a particularly good 14 x 17 bromide enlargement, a figure study, called "The Fisheries Question."

Mr. F. C. Beach had five 8 x 10 photographs, three of which were the interiors of the rooms of the Society and which he presented. One of the interiors of the Society's dark room was especially admired by the committee. His others were portrait and landscape studies of fair merit. He showed three 4 x 5 prints on Pizzighelli's new printing-out platinotype paper.

The admirable exhibit of landscapes, embracing twenty 5 x 7 views in one large frame, by Mr. Grisdale, was especially liked. That called "Putnam Valley, N. Y.," was particularly striking, and was marked by the committee as being one of the best. His views around Dingman's Ferry, Pa., were beautiful in their combination of landscape and water effects.

Mr. Edward Leaming, to whose excellent judgment the hanging and arrangement of the photographs is due, showed three 5 x 8 marine views; that of an old wreck in mid-ocean, called "On the Steamers' Track," was considered the best.

Adjoining his exhibit was that of Mr. Ferdinand Rupert, which included nineteen remarkably clear and beautiful $6\frac{1}{2} \times 8\frac{1}{2}$ views, mostly taken in Germany. He had a very good magnesium light group also, but his "Old Fortification at Wuerzburg" was especially fine. The brilliancy and snap shown in his pictures indicate that he uses excellent judgment both in timing and in development.

Mr. Ralph McNeil had ten $6\frac{1}{2} \times 8\frac{1}{2}$ pictures, some of his interiors being very well done, while his view of the Steamship "City of New York," was of especial merit and technical excellence.

Of Mr. J. B. Colton's eleven $6\frac{1}{2} \times 8\frac{1}{2}$ views, that of an "Old Mill" was the best. Mr. Canfield's 8×10 of roses was, as usual, a very attractive picture, both as regards its lighting and arrangement.

Mr. L. P. Atkinson had the only carbon print in the exhibition; it was $6\frac{1}{2} \times 8\frac{1}{2}$ in size and very well done. It was labeled "Developed with Water." He had also in one frame six micro-photographs and twenty-two stereoscopic pictures in a revolving stereoscope, which he kindly loaned for the exhibition.

Two very attractive frames for holding twenty-two photogravures in different tints, were exhibited by the New York Photogravure Company, and were particularly good. A novel one was in different colors of Mr. Fennessy's residence in Springfield, Mass., from a negative by M. P. Warner. It was what might be termed a chromo-photogravure. Another interesting picture was the "Tower of Catherine de Medici," full of exquisite detail.

Major Geo. Shorkley had twelve photographs, illustrating his success with the detective camera; some of them were 5×7 in size. A very pretty road along a pond, lined with old and graceful trees, was quite attractive, having a particularly clear and soft effect. His series of Creedmoor views were especially good, one being selected by the committee as the best. His picture of "Chickens" was also very interesting.

Of the six 5×8 views of Mr. Schedler, the instantaneous one of Niagara River Rapids was the best. The detail and clearness of the photograph was remarkable.

Mr. Otto Hesse sent five 4×5 miscellaneous pictures; that called "Bolton Bay, Lake George," was regarded as the best. Lieutenant Howell's exhibit of $6\frac{1}{2} \times 8\frac{1}{2}$ views of Japan and scenery, printed on plain paper by Mr. Leaming, were very interesting.

The eight $6\frac{1}{2} \times 8\frac{1}{2}$ photographs, in six frames, by Mr. W. B. Post, were excellently done and included several portraits; one of a girl, leaning on a fence, showed artistic posing. Another picture of horse and carriage was very well done.

Mr. Clarence S. McKune had in a single frame an excellent enlargement of an old farmer seated in a rocking chair on the piazza of his residence, sharp, clear and well arranged. His 4×5 view of a boat sailing was excellently done.

Three aristotype photographs, $6\frac{1}{2} \times 8\frac{1}{2}$, nicely framed, were shown by Mr. E. F. Timme, and were generally good, except that they appeared to be somewhat too black in the shadows. They were, however, interesting as showing what amateurs can do with these new papers.

Lieutenant Howell contributed a large transparency of yachts, which was particularly fine, and Mr. David Williams had one of a party of girls from a negative made by the aid of the magnesium flash light, which was very good. Mr. Cobb exhibited a number of professional prints of foreign subjects.

Altogether the exhibition, though gotten up hurriedly, excited considerable interest among members and their friends; the attendance was quite large, amounting it is said to nearly a thousand. Over five thousand invitations were sent out. A special committee, consisting of David Williams, Chas. Simpson, H. T. Duffield, C. S. McKune and Edward Leaming, designated what they considered the best pictures out of each exhibit. No diplomas or prizes were awarded.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

WET AND DRY PROCESSES CONTRASTED.

BY HENRY J. NEWTON.

[An Address before the New York Camera Club.]

IN speaking to a body of amateur photographers of to-day I am probably addressing those who are not practically familiar with the wet process. I presume that, of the amateurs of the present time, not one in ten has ever worked the wet process or even seen it worked. Therefore, the task set me of making a comparison between the wet and dry methods in photography is not a very light one, as it involves the necessity of setting forth in detail all the complicated work necessary in using the wet process and the chemistry involved.

This should be done that you could more clearly comprehend the difference and perceive the contrast between the superseded wet process and the dry method of the present. I shall, however, on account of the limited time, be unable to go into any detailed comparison of different photographic processes, and treat the subject this evening in the most general way.

Certain conditions are necessary for the production of a photographic impression, whatever may be the process employed or whatever result or effect is intended, whether the process used be wet or dry. 1st, a vehicle or receptacle to carry the sensitive surface; 2d, the substance, which is sufficiently sensitive to light; 3d, chemical substances known as developers; 4th, fixing agents, which have the quality of dissolving the sensitive compound which has not been acted on by light. In my use of the word light it is taken for granted that light is one of the essentials in the production of a photographic image, and that the exposure of the sensitive surface to light is regulated by the quantity and quality or actinism of the light employed. The fact that a photographic impression can be made in the dark by mechanical appliances, as has been shown by the eminent chemist, M. Carey Lea, is of no value to the amateur beyond the fact of its being an addition to his fund of knowledge, and also intensely interesting to every student of nature, as were also the extended experiments of Humboldt in this direction, so far as darkness was concerned. He placed plates of metal a few inches apart in a dark box and left them for weeks and even months, one of the plates having a medallion surface and the other a plain surface. In time it was found that the medallion figure had made a visible duplicate impression in faint outlines on the metallic plate with the plain surface.

Primitive photographic manipulations were confined exclusively to obtaining impressions on dry surfaces. In Talbot's work there are intimations which will bear an interpretation admitting the possibility that wet, damp or moist surfaces may have been exposed to the action of light, but the absence of positive statement on this point has been interpreted against the probability of his having done so. What is known as the wet process was introduced by Scott Archer in 1851, by the use of collodion. Le Gray, however, should be credited with first suggesting the idea of using gun-cotton or collodion in photography. This marked a new epoch and the longest step in advance which had been taken up to this time. Archer introduced pyrogallic acid as a developer instead of gallic acid which had been used before, which was shortly after superseded by the use of the proto-sulphate of iron suggested by Talbot. This put the wet process about where we find it at present.

The inconvenience of transporting a dark room and all the paraphernalia necessary for field work was the incentive to experiments in dry plate photog-

raphy. A multitude of methods were devised by many experimenters, resulting good, bad and indifferent, during the time of interest centering in the effort to produce sensitive dry plates by the bath process. A combination of chloride of silver in collodion was introduced and used mainly for producing positive prints on porcelain. This compound was known as collodio-chloride; and by making it very acid it would keep several weeks with silver in excess, which is a necessary condition of chloride of silver in order to obtain good prints. This was undoubtedly what suggested the bromide of silver and the formation of the bromide emulsion with collodion, which, together with the alkaline development, marked another important epoch in the development of photography, and resulted in the production of dry plates superior in every respect to any which had heretofore been produced, and brought them into direct competition with the bath plate, as the dry plates at that time contrasted favorably with the wet, not only in sensitiveness but also in quality. This condition of progress will carry us to the introduction of the gelatine emulsion dry plate, which in point of sensitiveness lead a long way in advance of any of the preceding methods. This marked another epoch in advance whereby instantaneous photography became much more practical, as one-twentieth or less time of exposure only was required. The quality of the negatives produced by the gelatine emulsion process has not wrested any laurels from either the wet or dry collodion formulas. It is almost the universal verdict of experts, whether amateur or professional, that the processes in which collodion is used is capable of producing more beautiful results than any other known in photography.

What appears to be the essential difference in the two processes now under consideration, consists in the fact that the substance used to carry the sensitive silver compound in one is vegetable and in the other animal. If this was all the difference between the two formulas, the results obtainable by either process would be very similar; at least there would be no marked difference in sensitiveness; but by forcing a partial decomposition of the gelatine, which is accomplished by the application of heat, greatly increased sensitiveness is the result. In the collodion formula such a result, by such a method, is not attainable, as the solution is in ether and alcohol, which fact would render decomposition by heat impossible. If it were possible to dissolve pyroxaline in water, it is theoretically possible that analogous results from similar methods might follow. That, however, is an impossibility. It is, therefore, necessary to adopt a different method in order to obtain the maximum point of sensitiveness in collodion emulsion. This is accomplished by making the emulsion with the silver in excess. The influence of this excess of silver on the collodion emulsion is, in many respects, the same as heat on the gelatine emulsion; the sensitiveness is steadily increased until it reaches the fog line, which, with a neutral collodion, would be accomplished in from twelve to fifteen hours. Heat would shorten the time. A few drops of acid to the ounce would, however, extend the time to twenty-four or even forty-eight hours. The usual process was, after it had reached the desired condition, to precipitate the emulsion from its solution in ether and alcohol with water, and thoroughly wash it. Then, after sufficient drying, dissolve again in alcohol and ether.

My process consisted in applying a suitable chloride to the ripened emulsion, which converted the excess of silver into a chloride of silver, and which proved to be a valuable salt in the emulsion, and not only rendered the emulsion a permanent

compound but completely avoided the necessity of the great labor and expense of washing and re-dissolving. The collodion emulsion, however, could not be brought to the same degree of sensitiveness as the gelatine emulsion by this or any known process. The fog line would be reached when a degree of sensitiveness had been attained corresponding to a very sensitive bath plate. This brings us to the present time, and the few preceding years, with its improvements in the gelatine plates, which have mainly been brought about by manufacturers of commercial plates.

By referring to the history of photography during the last fifty years, it will be found that the present state of perfection of this art-science has been by the contributions of quite a large army of experimenters, some contributing more and some less; the lesser, no doubt, in many instances, have been essential contributions to the fund of knowledge which we are to-day in possession of. An important fact in this connection is that most of the discoveries which have contributed to make photography the important factor it is to-day in science, art, and mechanics, have been discovered, worked out and perfected by amateurs.

In conclusion, permit me to say that we must not fold our hands and cease to work because of the seeming perfection to which we have attained. We must realize the fact that nature holds more than a thousand secrets to every one she has permitted us to take from her great store-house, and that she holds them with great tenacity, and the price she exacts in exchange for her jewels is *labor*.

We must realize that there are multitudes of priceless gems stored in nature's mine, concealed in her dark recesses, waiting for a ray of light to illuminate some intellect, some thought to penetrate the gloom and reveal the hidden jewel. To illustrate this idea I will quote the closing paragraph of William Crooke's (F. R. S.) lecture delivered to the British Association for the Advancement of Science in 1879. The subject of the lecture was "Radiant Matter."

"We have seen that, in some of its properties, radiant matter is as material as this table. Whilst in other properties it almost assumes the character of radiant energy. We have actually touched the border land where force and matter seem to merge into one another, the shadowy realm between known and unknown, which for me has always had peculiar temptations. I venture to think that the greatest scientific problems of the future will find their solution in this border land and even beyond. Here it seems to me lie ultimate realities, subtle, far-reaching, wonderful."

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

MEETING OF EXECUTIVE COMMITTEE.

FIRST annual meeting of the Executive Committee Photographers' Association of America, held at the Revere House, Boston, Mass., January 17, 1889.

Present: H. McMichael, President; George H. Hastings, First Vice-President; J. M. Appleton, Second Vice-President; O. P. Scott, Secretary; G. M. Carlisle, Treasurer.

Meeting called to order by the President.

First order of business:

Reading reports of Secretary and Treasurer for the year ending December 31, 1888.

Appointing of Auditing Committee. Report of Auditing Committee: "We, the Auditing Committee, have examined the books and vouchers of Secretary and Treasurer and find them correct.

O. P. SCOTT,
GEORGE H. HASTINGS,
J. M. APPLETON,
Committee."

Reports of Secretary and Treasurer were received, and committee discharged.

W. I. Lincoln Adams, Editor *Photographic Times*, was appointed a Committee on the Progress of Photography.

AWARDS.

Resolved, That the Association award as a Grand Prize, a bronze figure, valued at \$200, and governed by the following rules and regulations:

Competitors for this award shall exhibit three plain photographs, subject, Longfellow's Poem "Evangeline," size not less than 13, or larger than 22, inches in length.

Pictures to be tastily framed either with or without glass and the award to be made for the most meritorious collection.

Class A.—Four gold medals for the four best exhibits in Genre Photographs. Competitors for this class shall exhibit six photographs; subjects to be chosen by the photographer and appropriately inscribed. Size not less than 13 or more than 21 inches in length and tastefully framed with or without glass, and the award to be made for the best four collections.

Class B.—One gold, three silver and three bronze medals for best collection of Portrait Photography, in all sizes, from cabinet to 20 x 24 inclusive, and as above tastily arranged.

Class C.—One gold, one silver and one bronze medal for best collection of Landscape Photography; one silver medal for best collection of Marine Views; and one silver medal for best collection of Architectural Views.

Class D.—One silver and one bronze medal for the six most artistically retouched negatives any size; prints to be exhibited with negatives before and after retouching.

Class E.—One silver medal for the best six plain enlargements, either in silver, bromide, carbon or platinum; size not less than 18 x 22 inches.

Class F.—One silver medal for the best substitute for glass for negatives; and one bronze medal for the best and latest improvement in Photographic Appliances.

Class G.—One gold and one silver medal for the best foreign exhibits of Portrait Photography.

Competitors in all classes, except Class G, must be members residing in the United States or Canada.

American competitors in Class A cannot enter in Class B, but all can compete for the grand award.

CHOOSING JUDGES.

The President will name a chairman from competitors of each class, who shall call a meeting of those competing who shall select three judges for each class.

A competitor in any class shall have one vote, except members of the Executive Committee, who shall not be eligible to vote in any class.

RULES GOVERNING JUDGES.

Each judge must examine exhibits separate from the others, and hand in a sealed report of his marking to the Executive Committee who shall open them in presence of the judges, and the Secretary shall take each report and determine the winners.

Should any person or persons use their influence in any way, directly or indirectly, with the judges during their term of office in favor of any exhibit, it shall be the duty of the judges to strike said exhibit from the list of competitors.

The following principal points must be considered :

1st, lighting; 2d, posing; 3d, chemical effects; 4th, general effect of finish.

Ten points to be the highest award in any one branch, consequently forty points the most that can be given to any one picture.

The exhibition of photographs connected with our convention is to be considered an art exhibition pure and simple, and in order not to detract from this standard no sign of any description shall be allowed in the hall devoted to the display of photographs, except the name and address of exhibitor.

Each picture or set of pictures must be marked with a letter signifying the class in which it competes.

All exhibits must remain on exhibition until Saturday, the 10th.

All photographs must be from negatives made since the last Ninth Annual Convention, held at Minneapolis, July 14, 1888.

One diploma will be awarded for the most tastefully arranged exhibit.

H. McMichael was made a Committee on Medals, members' badges and issue of souvenirs; G. M. Carlisle and George H. Hastings Committee on Hotels; G. M. Carlisle Committee to secure Stenographer.

The Tenth Annual Convention will be held at Mechanics' Hall, Boston, Mass., August 6th to 9th inclusive, 1889.

The Art and Merchants' department will be closed each day from 10 A.M. to 12 M., to secure a large attendance at the meetings.

The Art department will be open to the public Thursday evening, Friday, and Friday evening, admission twenty-five cents.

The first and second Vice-Presidents are a Committee to have charge of art exhibits.

Manufacturers and Merchants were made a Committee on Railroads.

G. M. Carlisle and George H. Hastings a Committee on Exhibition-Hall accommodation.

On the evening of the first day of the Convention, Edward L. Wilson, Editor "Wilson's Photographic Magazine," will give an illustrated lecture on art principles useful in photography, to be followed by discussions.

On the evenings of second and third days, evening sessions will be held for the purpose of reading papers, and discussion on same.

One of the special features of the Convention will be a clam bake at Nantasket Beach, where the entire party will have a semi-centennial group made by Mr. Hastings, of Boston.

PROGRAMME.

First Day.

1. Address of welcome.
2. Calling meeting to order.
3. Roll call.

4. Reading minutes of last meeting.
5. Report of Special and Standing Committees.
6. Selection of location.
7. Appointment of Committee on Nominations.
8. Committee on Awards.
9. President's Annual Report.

Second Day.

1. Reading of Communications.
2. Unfinished business.
3. Report of Committee on Nominations.
4. Report of Special Committees.
5. New business.

Third Day.

1. Reading Communications.
2. Unfinished business.
3. New business.
4. Election of Officers.

Fourth Day.

1. Reading Communications.
2. Report of Committees.
3. Unfinished business.
4. New business.
5. Announcing Awards.
6. Closing ceremonies.

OUR ILLUSTRATION.

WITH this issue of the BULLETIN we present our readers with an interesting study of light and shade reproduced in photogravure from the picture, "The End of the Harvest," and made by the Photogravure Company of New York. The soft blending of the tones in the picture are worthy of special study and might well serve as a *motif* for some photographic composition.

While interested in photography I feel that I must have the BULLETIN.

HENRY SHEARER.

Will I renew my subscription? Well, I should smile!!!! (Check enclosed.)

G. S. MIDDLEBROOK.

I have been a constant reader of the BULLETIN, and have gleaned a lot of valuable information from it.

N. A. CHAMBERLAIN.

YOUNG Author—"Do you know that our mail service is in a most demoralized condition? It seems to take a letter an age to reach its destination." Old Friend—"Have you been troubled with it?" Young Author—"I should say I had. I sent a poem to a New York paper more than four months ago, and it hasn't been printed yet."—*Time*.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, DECEMBER 11, 1888.

(Continued.)

The papers are prepared by an entirely new process, keeping their primary color for several days after being sensitized (being excluded from light and sulphur fumes in the meantime, and the way to do this is to place the paper in tin tubes made nearly air-tight).

To sensitize, float on any ordinary silver bath, and fume from twenty to thirty minutes, or swab with ammonio-nitrate of silver, made thus: To 480 grains of silver add 12 ounces of water; when dissolved, pour off one-third; to the remaining two-thirds add strong ammonia, which forms a precipitate, and still add until all the precipitate is re-dissolved, then add the remaining one-third to this; add sufficient chemically pure nitric acid, drop by drop, until the residue is nearly taken up; this needs no fuming, and when dry it is ready for use, and in Mr. Clemons' judgment makes the best prints. If the bath discolors, add a few drops of table salt solution and sun well.

In a letter to this society Mr. Clemons says: "I use my gold acid, that is, I make it up and do not drive the acid off; but when I come to use it I neutralize it with bi-carbonate of soda. But if I were to use neutral gold I then would use borax, making a saturated solution of borax, and take one ounce of the solution and six ounces of water; to this bath I would add a sufficient quantity of gold solution (15 grains to 15 fluid drams) to tone the prints in about ten minutes."

The prints were very charming and much admired by the audience.

DR. HIGGINS, at the request of the President, exhibited his new detective camera, stating in substance that it was a 4x5 camera, holding one dozen plates in six double holders, and all of them absolutely outside of the field of view. He thought most of the detective cameras in use to-day had such a variety of knobs, machinery, buttons and everything else around them, that it was pure nonsense to call them detective cameras; in fact, that they were anything else but detective cameras. He then described very minutely the various points of his invention.

The *President*—Dr. Higgins has authorized me to announce as a gift to the society, on behalf of Mr. E. L. Wilson, its editor, of a copy of his 1889 "Mosaics."

A vote of thanks was then tendered Dr. Higgins for his courtesy in exhibiting the camera to the members of the society, and also a vote to Mr. Wilson for his gift.

MR. CHAMPNEY—Is your camera yet in the market?

DR. HIGGINS—The camera I have shown you is a camera of my own handiwork, except the covering of leather, which, of course, I could not do. It is fully covered by Letters Patent. It is not in the market, and whether it will ever get in the market I cannot tell, such event being dependent upon its sale to some one of our large manufacturing houses.

The *President*—We will now have the screen lowered, and those who are willing to stay will see some very good pictures.

The screen was lowered and the lantern operated by Mr. Beach and Mr. Simpson. The lantern slide made during the evening, developed with hydroquinone and soda, was thrown on the screen and compared with two others of the same subject, developed with pyro and soda; one of the latter description was rather the best, having a pleasant brown color. The high lights in these and others, including slides of portraits, were remarkably clear and brilliant. Following these were a miscellaneous lot of slides made by Mr. Newton on his emulsion about thirteen years ago; some of them were of excellent quality. Next, about twenty-five collodion emulsion slides, 4x5 in size, made about twelve years ago by Dr. Higgins, after the formula furnished by the doctor to Mr. Levy, were put through the lantern, mostly copies of paintings and reproductions, exhibiting those brilliant qualities so markedly obtained by bromide emulsions.

The meeting broke up at a late hour, many subjects provided for it having to be left over till the January meeting.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

SECRETARY'S REPORT.

INDIANAPOLIS, IND., December 19, 1888.

Receipts.

From G. M. Carlisle, Treasurer.....	\$107 00
For space in stock department.....	1,257 70
	<hr/> \$1,357 70

Disbursements.

For postage.....	\$6 70
Expressage and freight.....	15 00
Exchange.....	1 80
C. L. Jacobi, photos of stock department.....	10 00
Stationery for President and Secretary.....	13 25
Electrotypes of medals.....	10 00
File envelope.....	25
Wrapping paper for circulars.....	45
Envelopes for Constitution and By-Laws.....	50
Tubes for mailing diplomas.....	1 00
5,000 circulars (R. R. and Hotel information).....	30 00
Paid to G. M. Carlisle.....	1,268 75
	<hr/> \$1,357 70

W. H. POTTER, *Secretary.*

LIST OF EXHIBITORS IN STOCK DEPARTMENT.

Ph. Bonte.....	\$20 00	Brought forward.....	\$501 10
Air Brush Co.....	20 00	Geo. H. Eastman.....	67 60
G. Cramer.....	67 50	Bausch & Lomb.....	20 00
H. Ford.....	20 00	Scoville Manufacturing Co.....	20 00
O. C. White.....	20 00	Smith & Harrison.....	20 00
J. C. Somerville.....	20 00	W. G. Entekin.....	67 50
S. P. Cox (Lunch stand).....	10 00	H. A. Hyatt.....	20 00
Blair Camera Co.....	49 40	Collins Manufacturing Co.....	67 50
J. H. Bryant.....	120 00	E. & H. T. Anthony.....	47 50
Bronte Frame Co.....	44 20	Zimmerman Bros.....	67 50
Packard Bros.....	20 00	Shultze Photo Equipment Co.....	20 00
J. C. Neame.....	20 00	Sweet & Wallach.....	40 00
Greer & Barryman.....	5 00	Caldwell.....	54 00
Brown & Goldsmith.....	5 00	Gatchell.....	20 00
Acme Color Co.....	10 00	L. W. Seavey.....	25 00
W. H. Walmsley & Co.....	10 00	M. A. Seed Dry Plate Co.....	67 50
McCollin & Co.....	20 00	O. H. Peck.....	87 50
Acme Burnisher Co.....	20 00	Allen Bros.....	20 00
		J. A. Knorr.....	25 00
	<hr/> \$501 10	Total.....	<hr/> \$1,257 70
Theo. Endean (failed to pay).....	20 00		

W. H. POTTER,
Secretary.

"CAN you lend me twenty-five dollars this morning, Mr. Williamson?" asked a needy friend entering the broker's office.

"Sorry, Barrows, but I really can't. Mrs. Williamson went out this morning to buy a little surprise for me, and she took all the money I had."—*Harper's Magazine.*

G. M. CARLISLE, Treasurer, in Account with the PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

Dr.

Cr.

1888.			
Jan. 1.	Cash on Deposit.....	\$3,366 06	
	Received from 117 new members.....	585 00	\$44 29
	" " 335 old ".....	670 00	255 00
14.	" " 450 visitors, 25 cts. each.....	114 75	61 25
	" " dealers for floor space.....	1,271 70	55 75
	" " ads. in By-Laws.....	201 00	43 45
	" " interest to July 1, 1888.....	60 48	41 50
Feb. 6.			49 55
11.			31 21
21.			83 13
March 20.			52 65
May 15.			100 00
June 25.			200 00
July 9.			80 00
14.			50 00
15.			675 00
			01 17
			57 37
			82 00
			2 15
			80 00
			55 70
			30 00
			77 50
			84 61
Aug. 8.			53 75
20.			142 07
30.			50 00
Sept. 10.			08 85
Dec. 3.			150 00
			200 20
			200 20
			7 00
			2 55
			10 00
			3 00
			3 50
			1 84
			50
			3 00
Cash now on deposit.....		\$3,311 16	
		2,017 83	
		\$6,228 99	

PROVIDENCE, R. I., December 10, 1888,

Respectfully submitted,

G. M. CARLISLE, Treasurer Photographers' Association of America,

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

THE annual meeting of the society was held Wednesday evening, January 2, 1889, the President, MR. FREDERIC GRAFF, in the chair.

The annual report of the Treasurer was presented and ordered to be filed.

The Executive Committee made their annual report, reciting the principal events of interest in the history of the society for the past year.

One of their first duties had been to arrange for the removal from the former cramped quarters of the society to the new room now occupied, where the first meeting, with an attendance of seventy, was held on April 4th.

The average attendance for the ten stated meetings during the year was forty-six,

A list of books and journals added to the library was submitted, special mention being made of the donation from Mr. F. De B. Richards, which puts the society in possession of a valuable stock of older and rarer literature of photography, and of the gift made by Mr. George W. Childs of Muybridge's valuable Atlas of Animal Locomotion.

In the early part of the year (January 11th) a public lantern exhibition was held. Technically the display was certainly a very successful one and resulted profitably to the society.

Under the management of the American Lantern Slide Interchange, slides have been received for exhibition from New York, Pittsburgh, Louisville and New Orleans, Philadelphia Amateur Photographic Club, St. Louis, Chicago and Cincinnati.

The annual distribution of presentation prints took place last fall, and while this is a custom that may be valued by some, the committee called attention to the fact that to maintain it, it costs about one-sixth as much as the annual rent paid by the society, and the considerable sum thus spent supplies the members with an article of which photographers not infrequently have a superfluity. The suggestion was made that if any prescribed number (say four or six) of the best pictures produced by members within each year, were selected by a committee and were at proper intervals bound and preserved, the society would have a valuable record of work done, and members would have quite as much of an incentive to good work as is now offered by the presentation print scheme.

Reference was made to the sudden death,

on June 13th, of Mr. S. Fisher Corlies, a most genial and popular member, who had long served the society as Treasurer, doing it, as he did all things, well and thoroughly.

The Active and Life Membership, December 31st, was reported as 182.

During the year thirty-six new members had been elected. There had been five resignations and one death, making a net increase of thirty members.

The Joint Exhibition Committee announced that arrangements had been made for holding the Third Annual Joint Exhibition at the Pennsylvania Academy of the Fine Arts during the two weeks beginning April 8th. Probably three or four evenings would be devoted to the display of lantern slides. Circulars with full particulars would be issued about January 15th.

Mr. William H. Rau, for the American Lantern Slide Interchange, announced that slides from Louisville and New Orleans would be shown at the Conversational Meeting, January 16th.

The Committee on Membership reported the election of the following active members:

Eckley B. Coxe, Jr., Percy S. Marcellus, James W. Torrey, Winfield S. Clow, H. A. North, Charles M. Cresson, M.D., Herbert Harker, George A. Dunning, Theodore H. Luders, George McClellan, M.D., Walter H. Brand.

The election for officers and committees for 1889 resulted as follows:

President, FREDERIC GRAFF.

Vice-Presidents, JOHN G. BULLOCK, JOSEPH H. BURROUGHS.

Secretary, ROBERT S. REDFIELD.

Treasurer, SAMUEL M. FOX.

Executive Committee, Dr. Herbert M. Howe, Dr. Eilerslie Wallace, William A. Dripps.

Excursion Committee, Samuel Sartain, John Carbutt, W. D. H. Wilson.

Committee on Membership, Henry T. Coates, John Bartlett, George Vaux, Jr., David Pepper, Edward W. Keene, Joseph H. Burroughs, Dr. Charles L. Mitchell, Frank Bement, W. H. Walmsley.

Committee on Revision of Minutes and Articles for Publication, John C. Browne, John G. Bullock, Robert S. Redfield.

Committee on Lantern Slides—Edmund Stirling, Frank Bement, William H. Rau.

The President on accepting the chair for the year 1889, made the following remarks:

"I assure you I most highly appreciate the

honor you have conferred by again electing me to preside over the affairs of the photographic society, in which I have been so long and deeply interested.

"I take great pleasure in congratulating you upon the prosperity of the society, and that it so ably maintains its reputation and influence in advancing the interest, now so general, in the useful, instructive and pleasurable pursuit we are all engaged in.

"The reports of our Executive Committee and officers are so full of details that nothing more is left in that direction for me to say.

"We certainly have reason to feel proud of the papers read and of the work of our members from time to time exhibited.

"I feel quite satisfied that in the high character of the specimens shown here of lantern slides, negatives and prints, it is evident that we not only hold our own, but steadily improve.

"I desire particularly to call attention to the exhibition about to be held jointly with the "Boston Camera Club" and the "Society of Amateur Photographers of New York" at the Academy of Fine Arts, commencing April 8, 1889, and sincerely hope that the members will use all their efforts to make the exhibition an eminently creditable one, even more so than that held three year since at the same place.

"I will not detain you by any attempt to recapitulate the new processes that have been brought forward during the past year. This is done so fully in the many journals now published, to be found upon our library table, that I should only repeat, probably with fewer details and less instruction, what they have already said.

"I think we have every reason to look forward to a year even more full of improvement than the past, which, while it has not been remarkable perhaps for any very startling new methods, has most certainly brought forth many valuable improvements on old ones. The introduction of new supports for the sensitive medium as substitutes for glass, increased sensitiveness of films, and more portable apparatus, has added to the facility of working, and given renewed inducement for amateurs to indulge in photography as a study and amusement.

"I believe all have been pleased with the neat and comfortable room we now occupy. It is, however, quite evident from the rapid and gratifying increase in our membership, that before the year expires we shall probably have outgrown the limits of our present desirable quarters.

"I cannot close without referring to the great loss sustained by the society in the death of Mr. S. Fisher Corlies. You all knew the deep interest that he took in our welfare; how he was always ready to help those not so fully educated to the work as himself, and how, as a warm friend and companion, we must miss him and mourn his loss.

"I most sincerely hope that the year 1889 will be to all of you one full of success and prosperity."

Mr. EDMUND STIRLING presented, as supplementary to Mr. Childs' recent gift, a book entitled "Animal Locomotion," "The Muybridge Work at the University of Pennsylvania; the Method and the Result," which was accepted with a vote of thanks.

Mr. BARTLETT exhibited several photographs which were interesting from a historical point of view, the property of Mr. Julius F. Sachse, of Philadelphia; they were the work of Mr. Langenheim, one of the pioneers of American photography, and antedated the days of collodion. The impressions, which date about 1850, were made from silver albumen glass negatives upon plain paper, without toning, and represented a portrait of Mr. Langenheim, one of President Fillmore, a view of the Treasury Building at Washington, and what seemed to be an instantaneous view of Niagara Falls with natural clouds.

The first attempts at negative retouching were apparent, and the importance of the process indicated by the signatures of the retoucher appearing on the prints.

Adjourned. ROBERT S. REDFIELD,
Secretary.

BOSTON CAMERA CLUB.

REGULAR MEETING DECEMBER 31, 1888.

THE meeting of the club on above date was devoted to lantern slides, Messrs. Briggs and Wilder being the contributors.

The slides embraced views at White Sulphur Springs and Kanawha, Va., Northern Vermont and Walworth, N. H., among the White Mountains.

They were much admired and enjoyed by the large audience present.

A few slides, colored by a lady artist of Boston, were shown, two of them being especially fine, a new departure in gelatine work.

THE ANNUAL MEETING of the club was held at the rooms on Monday evening, the 7th instant.

The reports of the different officers were presented, showing an encouraging state of

affairs. The membership has increased fully one-fifth during the year, while the financial exhibit was so satisfactory that it was voted to pay fifty per cent. of the club loan from funds in the treasury.

Considerable new apparatus has been purchased and paid for during the year.

The following officers were elected for the ensuing year: President, George E. Cabot, Brookline; Vice-President, Francis Blake, Auburndale; Secretary, Edward F. Wilder, Boston; Treasurer, William Garrison Reed, Boston; Librarian, William S. Briggs, Boston. Executive Committee for three years: Charles H. Currier, Boston; John C. Hubbard, Brookline.

A pleasant feature of the meeting was an informal exhibition of work of members only.

A circular had been sent out by the Entertainment Committee inviting each member to contribute not more than two mounted prints for this exhibition.

The rules governing it were few and simple:

1st. The prints must be direct, neither enlargements nor reductions being eligible.

2d. Nothing but title to appear on the front of mount.

3d. Prize to be awarded by vote of those present at the meeting.

The response to the invitation was very general, forty-six members contributing ninety-two prints for competition, besides more than fifty for exhibition only, the latter including several enlargements.

The pictures were arranged on the walls of the club's reading-room and made a very interesting and creditable exhibition; most of the best workers being represented.

The vote, which was announced at the close of the meeting, was as follows:

No. 8. View at No. — Grafton, by C. H. Currier, received nine votes.

No. 29. Artists' Retreat, Waterville, N. H., by Wilfred A. French, seven.

No. 35. The Last Load (a hay-making scene), by William S. Briggs, and No. 7, Salt-ing the Sheep, by Mr. Currier, six each.

The prize (a copy of Burnett's Art Essays, presented to the committee by two members of the club) was awarded to Mr. Currier.

An elegant collation concluded one of the fullest and most enjoyable meetings the club has ever held.

E. F. WILDER,
Secretary.

WASHINGTON CAMERA CLUB.

SPECIAL meeting, December 26, 1888. Informal meeting only, no quorum being pres-

ent at the time of calling meeting to order. The evening was pleasantly and profitably spent by those present in experimenting with the Hubbard flash apparatus, and also with a new projector in connection with the club lantern.

ANNUAL MEETING, JANUARY 8, 1889.

Meeting called to order 8.15 P.M., *Pro-tem* Aut Richards in the chair. Thirteen members present. Two applications for membership received and posted. Report received from Album Committee relative to receipt of prints for club albums.

Under the head of new business, Messrs. Fisher and Schneider (E. A.) were appointed Audience Committee to audit treasurer's accounts for 1888, to report at next regular meeting. The following amendments were proposed to the Constitution:

Mr. G. A. Warren proposed amendment to Art. IV., Section 1, to include election of Album and Room Committees at the annual meetings; hereafter, these committees having been appointed heretofore by the President; also amendment to Art. VII., Section 2, in regard to contribution of prints for club albums, amending the article to include lantern slides, and also to provide a club collection of lantern slides to be under the control of the Album Committee, to be loaned to members for a length of time not exceeding one week, upon application of same in writing, and providing a penalty for retention of same longer than one week; also an amendment by Schneider (W. E.) to Art. IV., Section 1, creating the office of Vice-President.

A vote of thanks was extended by the Club to the Hon. A. A. Adee, for contribution of volumes of *Photographic Times*, 1886, 1887 and 1888; also *British Journal of Photography* for 1888; also vote of thanks to Henry Talbott for contribution of framed pictures for club room.

Mr. Hansman made a motion relative to admission of ladies, in order to obtain the sense of the meeting. A favorable opinion seemed to prevail and at the next meeting proposals for membership are in prospect from a number of lady amateurs.

This being the annual meeting, the club then proceeded to ballot for officers for the ensuing year, with the following result:

President, Robert J. Fisher; *Secretary-Treasurer*, S. H. Griffith, M.D., U.S.N.; *Corresponding Secretary*, J. A. Cole; *Board of Trustees*, D. E. McComb, F. A. Schneider, P. T. Dodge.

President Richards yielded the chair to the new president, a speech from whom was in order. After passing a unanimous vote of thanks to the retiring president, and other officers of the club for 1888, the club adjourned at 10.15 P.M., the next regular meeting being January 29, 1889.

ALBERT COLE,

Corresponding Secretary.

PHOTOGRAPHIC SECTION OF THE MANHATTAN CHAPTER OF THE AGASSIZ ASSOCIATION.

At the regular monthly meeting of the section, held at the rooms of the chapter, 103 Lexington avenue, New York, on Friday evening, January 18th, the annual election of officers occurred, with the following result: *President*, W. T. Demarest; *Vice-President*, W. P. Weidman; *Recording Secretary*, C. F. Groth; *Corresponding Secretary*, E. B. Miller; *Curator*, R. P. Moeller; *Librarian*, F. W. Roos; *Board of Trustees*, A. Nehrbas, F. Schneider, O. H. Lee, J. Bauermann, M. D., and J. Nehrbas.

The election was not concluded until a late hour, in consequence of which the lecture on Objectives, by Mr. Frederick Schneider, was postponed until the next regular meeting, which occurs Friday evening, February 15th, when all interested are cordially invited to attend.

W. T. DEMAREST.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—A. W. N. writes: Please give me the formula—How to prepare silk cloth to print silver prints on. How much gelatine to the ounce of water to coat cloth to sensitize upon. Also, please give formula for making a starch paste or parlor paste that will keep and is fit to mount photographs. Answer through columns of the BULLETIN.

A.—Make a sizing solution with gelatine, using about three grains to the ounce of water, and add to it three grains of ammonium chloride. Apply to fabric you wish to print on and allow to dry. Now apply the nitrate of silver bath with a wad of clean cotton, not touching the unsized parts. Fume well, and print under negative in ordinary manner; also

tone, fix and wash as usual, lastly with hot water. The Daisy Permanent Paste made by our publishers is the most permanent paste of the kind we know of; try that.

Q.—W. S. E. writes: Please tell me, through the columns of the BULLETIN, what color paper is the best for papering a photographic parlor, to show display pictures to the best advantage; and also the ceiling—the room has only two windows at one end—and the best color paper for the operating room, and paint for wood work.

A.—Use a maroon with a flat finish for the walls of parlor, and a ceiling covered with a faint tinge of blue. In the operating room use neutral tint or gray. This also applies to the painting of wood work.

Q.—R. J. T. writes: Can you inform me, through the columns of the BULLETIN, the following: What is the chemical action on the plate, at the time of exposure, that causes the picture?

A.—There are a variety of opinions on this subject. As a matter of fact, the chloride, bromide, or iodide of silver, is decomposed, and some of the iodine, bromine or chlorine, as the case may be, is set free. This can be demonstrated after continued exposure for some time. But it is our own opinion that the effect of the light upon the gelatine plate, for instance, is to disturb the chemical force that holds the halogen and the silver together, and that they are then in a condition to be affected by the developer. But this is only an opinion; what we need is more research upon this interesting phase of photography.

Q.—F. M. L. writes: I send you two prints for your examination. If you can tell the cause of the trouble and answer in the next publication of the BULLETIN you will confer a favor on me, which I will appreciate. When the prints are made, no matter how nice and blue they print up, and put into water to wash out the silver preparatory to toning, they turn nearly blood red, simply in the water (nothing put in the water to redden them). When toned and put in the fixing bath they turn yellow almost immediately, but turn some darker when fixed and dried. Fresh silvered paper and the ready sensitized act just the same. Negatives developed in the same kind of water come out fine. Prints made at my home (which is several miles from the gallery) don't act so. We use the same formula or process at both places throughout. Now can it be in the printing bath, when the ready sensitized paper acts just the same? If the trouble be in the water, can you tell how to remedy it?

A.—Your trouble is probably due to the use of water that contains some acid materials. Try adding a little lime water to your wash water before using and allow it to settle. Use about an ounce of good, clear lime water to the quart of water, shake well and allow it to settle before use. You can also get much better results than the prints you send if you will thoroughly fume your paper before you use it; fume with strong ammonia solution thirty minutes.

Views Caught with the Drop Shutter.

W. STUBER & BRO., of Louisville, Ky., have left their old quarters and taken new, larger and more handsome premises in the Parr Block, 532 Fourth avenue. We wish them every success in their enterprise.

THE ACME BURNISHER COMPANY obtained the medal of superiority for their burnishers at the late exhibition of the American Institute Fair in New York. This is the highest award given by the Institute.

MR. REEVES, of Norwich, Conn., the inventor of the Reeves flash-light apparatus, has been using his invention in his studio every night for the past three months and with uninterrupted success. This is a pretty good test of its value and durability. We have ourselves seen it used very often, and the results obtained are uniformly good.

THE ALBERTYPE CO., of 58 & 60 Reade street, New York, send us a very pretty cal-

endar for 1889. It is full of little gems of their work, and we tender our thanks to the company for remembering us.

The Philadelphia Photographer as a name is no more; but as a progressive magazine of photography will continue to be edited by Dr. Edward L. Wilson, and in future will be known as "Wilson's Photographic Magazine." May its editor carry it through another quarter century.

"SUN AND SHADE" is again on our table. The January number is perhaps a little better than its predecessors, if that can well be. It is a pictorial record of artistic events, showing the onward march of photography in the domain of book and magazine illustration. As a novel method of exhibiting the progress of photo-mechanical printing it stands without a rival. The number before us contains a photogravure, "A June Morning," after Corot; another print by the same process, "Winter," by H. Rittig; a gelatine print, "Canon of the Rio Las Animas," by W. H. Jackson, of Denver, Col.; another gelatine print called "Modesty;" another showing some of Mr. Muybridge's studies in animal locomotion, and George F. Barker's "Horse Race," besides a number of others that lack of space compels us to pass unnoticed. This number is a particularly good one, and well worthy of study.

E. J. PARTRIDGE, brother of our good friend, Samuel C. Partridge, of San Francisco, has started as a photographic merchant at Portland, Oregon.

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PRINTED ON N. P. A. EXTRA BRILLIANT ALBUMEN PAPER.

From Negatives on ANTHONY'S PHOTO FILMS.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

FEBRUARY 9, 1889.

Vol. XX.—No. 3.

PHOTOGRAPHIC CHEMICALS AND THEIR IMPURITIES.

AMONG the many chemicals used in photography, the alkaline salts are the most important and often contain the greatest quantity of impurities. A number of these impurities are incidental to the processes by which the salts are manufactured, and not being easily eliminated in the course of purification, may cause very serious trouble when used for photographic purposes. Taking sodium carbonate as the first, and, perhaps, most useful alkaline salt in the process of development, let us stop a moment to consider the several processes by which it is made and the impurities it is likely to contain.

There are three processes from which the sodium carbonate of the American market may be obtained. The first of these is the old Leblanch process; the second, the Solvay or ammonia-soda process; and third, the cryolite process of the Pennsylvania Salt Company.

It is probable that most of the soda crystals are made from products produced by the Leblanch soda process, as practised in England. Without going into details, this process consists in first converting sodium chloride (common salt) into sodium sulphate by the aid of sulphuric acid; then by roasting this sodium sulphate with coal and limestone, the sulphate is converted into sodium carbonate ("crude soda ash" as it is called); this last product after crystallizing gives us the soda crystals of commerce. The sources of the impurities in this method of manufacture are numerous. The common salt used for the purpose is reasonably pure; at least the impurities are generally only lime and magnesium salts, which do no harm as far as photography is concerned. But as soon as the sulphuric acid is added, we begin to introduce a number of impurities. This acid as made in England often contains arsenic and nitrous compounds, which, when brought into contact with the sodium chloride, forms compounds with it that are by no means easily eliminated from the subsequent products. When we remember the exceedingly minute quantities of material that effect the photographic image, we are constrained to believe that the traces of arsenic often found in soda crystals may have some important effect upon photographic results. Yet the quantity of arsenic is exceedingly small in even the crude soda crystals, and possibly its presence is unimportant; nevertheless it is very active in its reactions and may have an influence far exceeding our expectations. But this is

not the most important impurity in soda crystals. The most serious trouble comes from the impurities introduced during the conversion of the sodium sulphate into carbonate by roasting with coal and limestone. Having made this roasting, the crude semi-fused mass is treated with water, which dissolves the sodium carbonate formed and gives the liquors from which the sodium carbonate crystals are ultimately obtained. An examination of these liquors reveals the fact that, in addition to the sodium carbonate which they contain, there is also present sulphite, hyposulphite, sulphide, and cyanide of sodium. It is obvious that unless the sodium carbonate is crystallized several times, traces of all these compounds find their way into the crystals. Their effect upon the photographic work done with such crystals is the more dangerous, according to their amount.

It is too true that there is much crude soda crystals in use that contain considerable quantities of sodium sulphate. This impurity is harmless, but it is an index of imperfect purification, and such crystals should not be used for photographic purposes. If one impurity is present in large amount, it is reasonable to suppose that others of more importance, and not as easily eliminated, are also present.

Fortunately we are not confined to the use of soda crystals, and there are two products in the American market that are admirably fitted for photographic use. Only they must be used with judgment. These products are the sodium carbonate made from cryolite, and a like product made from common salt by the ammonia process.

The first of these is perhaps the purest commercial sodium carbonate made, its only impurities being traces of alumina and lime. In using it, remember that it is dry sodium carbonate without any water of crystallization; consequently only about thirty-seven per cent. of the weight given for the crystals should be used.

The sodium carbonate made by the ammonia process is perfectly free from the dangerous impurities incidental to the Leblanch process; but it contains two products that result from its method of manufacture. One of these is ammonia salts and the other is an excess of carbonic acid. Dry sodium carbonate made by the ammonia process often gives a faint odor of ammonia, due to the volatilization of the ammoniac carbonate which it contains. The presence of the excess of carbonic acid in this last variety of sodium carbonate is due to the imperfect heating of the sodium bicarbonate, which is one of the steps in the process of manufacture. There is no particular harmful influence exerted by this excess of carbonic acid, but it makes it very difficult to determine the true strength of the material. It is almost impossible to know how much real sodium carbonate there is in such a product, the sodium bicarbonate being of little use as a developing agent.

Our space is now exhausted, but we shall return to this question of impurities in chemicals at an early date.

EDITORIAL NOTES.

FRANZ GEORGE SCHREIBER, now in his eighty-sixth year, and probably one of the first men to make photographs in America, is enjoying excellent health, surrounded by his family in the city of Philadelphia. He was, early in his career, associated with Langenheim and worked with him in the production of daguerreotypes. We hope soon to be able to give an account of his life. We

must now extend to him our congratulations upon his good health and the high regard in which he is held by those who know him.

AN International Photographic Festival, in commemoration of the fiftieth anniversary of the discovery of the daguerreotype, is to be held at the Crystal Palace, in London, commencing March 19th next. All communications in regard to space and rules should be addressed to S. G. Buchanan Wollaston, or John Francis Peasgood, at the Crystal Palace, Sydenham, London.

THE Society of Amateur Photographers of New York have secured space and intend to make an exhibit at the International Exhibition to be held in Paris this year. They will have a representative there to attend to their interests.

At the annual meeting of the Syracuse Camera Club, held January 5th, the following officers for 1889 were elected: *President*, Arthur P. Yates; *Vice-President*, Amos Padgham; *Secretary*, Wallace Dickson; *Treasurer*, Charles R. Jones.

THE Case School Camera Club of Cleveland, Ohio, has organized, with the following officers: Professor C. F. Mabery, S. D., *Hon. President*; Albert W. Smith, Ph. C., *Hon. Vice-President*; Frank E. Hall, *President*; Lafayette D. Vorce, *Vice-President*; J. Frank Morse, *Secretary and Treasurer*; Milton B. Punnett, *Corresponding Secretary*. As the club includes quite a number of the professors and students of the Case School of Applied Science, who are well versed in chemistry, it is expected that this phase of our art will receive more attention than is usually given to it by ordinary societies.

MR. HECTOR KRAUS, of Harrisburg, sends us the following as a method of reducing bromide prints that are too dark, and he says that he has saved many a valuable print with it: Make a saturated solution of chloride of lime, and filter it perfectly clear. Dilute one part of this solution with four to eight parts of water, and apply it to the fixed and washed print either in a bath or by flowing. If it acts slowly add more of the stock solution. It is best to use a weak solution, as the action is more under control. When the print is sufficiently reduced, wash well. The solution may be used a number of times; it does not discolor the print nor stain the paper.

THE Old Colony Camera Club, of Rockland, Mass., organized January 23, 1889, with W. G. E. Freeman as *President* and Burton O. Estes as *Secretary*.

In September, 1888, the amateur photographers of Atlanta, Georgia, organized a Camera Club, with Sumner Salter as *President* and F. J. Paxton as *Secretary*. The membership numbers about thirty, and although one of the youngest of the societies, it is doing excellent work.

MR. JAMES STREETER, of Rochester, writes us that the Photographic Section of the Rochester Academy of Science has ceased to exist, and that a new society has been formed which bids fair to be more successful. The new organization is called the Camera Club of Rochester. It has sixty-two members and Mr. Peter Mawdsley is the *Secretary*.

THE Camera Club of the Cincinnati Society of Natural History is still doing good work. At a recent meeting Mr. E. J. Carpenter read a paper on "Lenses and Lens Work," and an exhibition of the slides of the Pittsburgh club followed.

WE are indebted to the manufacturers of the celebrated N. P. A. Albumen Paper for their annual present of a handsome "Tree Cake," which is always an object of interest to receive and token of kind remembrances from across the water.

FROM Dr. Alexis A. Julien, of the School of Mines, Columbia College, we have received some interesting papers upon the "Decomposition of Iron Pyrites," illustrated with photomicrographs. To those who are interested in mineralogy, this work is a very complete and well-arranged report upon the subject. We have to thank Dr. Julien for his kind remembrance.

YET another amateur photographic society sends us notice of its organization. This is the "Hawaiian Camera Club," of Honolulu, with C. Hedemann, *President*; G. W. Smith, *Vice-President*; and A. W. Richardson, *Secretary-Treasurer*. There are about fifty members in the Hawaiian Islands.

MR. H. H. SNELLING, of Cronwell, New York, has a complete set of his "Photographic and Fine Art Journal," which he would like to dispose of. Should any of our readers desire to possess such a valuable set of one of the earliest photographic journals of America, they should communicate with Mr. Snelling.

MR. LANDY's beautiful picture of "Hiawatha," which took the Blair Cup at the Minneapolis Exhibition of the Photographers' Association of America, also obtained a "Medal of Superiority" at the recent exhibition of the American Institute in New York.

[From Photographisches Wochenblatt.]

COMPARISON OF THE SODA, POTASH, AND HYDROQUINONE DEVELOPERS, WITH POTASSIUM-METABISULPHITE, AND SODIUM HYDRATE AS ACCELERATOR.

BY CAPTAIN EUGENE HIMLY.

THE reports published lately in English, American and German journals about potassium-metabisulphite, have induced me also to make some tests with this preparation, partly to obtain a clear idea how small a quantity of hydroquinone is required to work with, and partly to find out how much potassium-metabisulphite is necessary for the preservation of the stock solution, whether from pyrogallie acid or from hydroquinone. In regard to hydroquinone, it is shown that 0.4 gram for each 100 cm. developing solution is the smallest quantity. If still less is employed, the development is very much retarded. As many professionals and amateurs work with hydroquinone soda or potash developer, and as the duration of such development is always from seven to eight minutes, I was thinking whether the employment of a preparation as accelerator was not advisable. I tried a small addition of caustic soda and caustic potash, that is, 200 of a solution of 50 parts caustic soda or caustic potash to 400 parts of water. The appearance of the first traces of the image was thus considerably accelerated and the duration of development reduced. The following table shows the several results. Concerning,

now, the quality of the negatives, they were good and useful with all the different developers, but it was apparent that the application of the caustic soda or caustic potash with soda or potash developers gives the more brilliancy and more detail, aside from the fact that the development is shortened by several minutes.

The potassium-metabisulphite retards the development very much if applied in too large quantities, but it preserves the stock solution considerably better than sulphite of soda alone. But it is not advisable to leave out the sulphite of soda or reduce the quantity of the same in the formulas, the color of the negatives being influenced very favorably by it. Potassium-metabisulphite colors the negative in the soda or potash pyro developer yellow, and the sulphite of soda weakens greatly this coloration; the addition of potassium bromide can easily be dispensed with by application of this preparation.

By means of these tests I can recommend the following developer solution with hydroquinone.

HYDROQUINONE-CAUSTIC SODA DEVELOPER. SOLUTION A.

Hydroquinone	10 parts.
Potassium-metabisulphite	4 "
Water.....	250 "

SOLUTION B.

Caustic soda.....	50 parts.
Water.....	500 "

For every 100 parts of water take 10 parts solution A and 10 parts solution B.

This developer acts very well for negatives, but not for positives on bromide of silver emulsion paper, producing an uneven and mostly reddish tone.

HYDROQUINONE-POTASSIUM DEVELOPER. SOLUTION A.

Hydroquinone	10 parts.
Potassium-metabisulphite.....	4 "
Water.....	250 "

SOLUTION B.

Carbonate of potassium.....	100 parts.
Sulphite of soda.....	50 "
Water.....	1000 "

Take for each development 10 parts solution A, 50 to 75 parts solution B, and 50 or 25 parts of water, according to whether a weak or strong developer is desired.

To accelerate development add 2 c.c. caustic soda solution (50 : 400 water), this addition having also a favorable influence upon the color of the picture. For the development of positives it is also very suitable.

HYDROQUINONE-SODA DEVELOPER. SOLUTION A.

Hydroquinone	10 parts.
Potassium-metabisulphite	5 "
Water.....	250 "

SOLUTION B.

Carbonate of soda.....	100 parts.
Sulphite of soda.....	50 "
Water.....	1000 "

For each development take 10 parts of solution A, 50 or 75 parts of solution B; to this add water, 25 or 50 parts. One is thus enabled to work with weak or strong developer.

This developer will also act considerably better if 2 c.c. of a caustic soda solution (50:400 of water) are added as accelerator. The same acts also excellently for positives upon bromide of silver emulsion paper, and works to great advantage by developing the same very uniform in tone.

It is to be recommended here to place the positives, before washing, in a weak solution of acetic acid, and leave them in the same for a short time. Positives of a yellowish appearance regain hereby their white color.

The application of bromide of potassium as retarder is unnecessary, the potassium-metabisulphite acting sufficiently.

The additions of potassium-metabisulphite, as well as the weak caustic soda solutions, having acted so favorably, I extended the tests to the soda-pyro and potassium-pyro developers. There it proved also that potassium-metabisulphite acted as a strong retarder. I tried likewise here to prevent this by an addition of 2 c.c. of a weak caustic soda solution, and was greatly surprised at the favorable results which I obtained. I have seen nothing yet about this in any of the journals, and its publication might therefore be of interest to a great many. I would not advise using more potassium-metabisulphite than given in the formula, as otherwise it retards still more.

It is also deserving notice that the preparation "Excelsior," introduced by me into the market (and as published by Dr. Eder several years ago), acts excellently with the soda developer. The table shows this exactly, but the preparation of the potassium developer does not act acceleratively. The other favorable proportions in the action of the Excelsior remain the same.

FORMULAS.		Parts of Pyro Solution.	Parts of Soda Solution.	Parts of Water.	Parts of Excelsior.	Parts of Caustic Potassium Solution 50: 400 Water.	The Picture Appears After Seconds.	Duration of Development.
PYRO-SODA DEVELOPER. <i>Pyro Solution.</i>								
Sulphite soda.....	100 grams.							
Water.....	500 "							
Sulphuric acid.....	8 drops.							
1. Pyrogallol.....	14 grams.	25	25	25	....	....	20	3½ minutes.
<i>Soda Solution.</i>								
Carbonate soda	100 grams.							
Sulphite soda.....	50 "							
Water.....	1000 "							
PYRO-SODA DEVELOPER. <i>Pyro Solution.</i>								
Water.....	500 grams.							
Sulphite soda ..	100 "							
Potassium-metabisulphite.....	5 "							
Sulphuric acid.....	8 drops.							
2. Pyrogallol.....	14 grams.	25	25	25	....	....	25	3½ minutes.
<i>Soda Solution.</i>								
Carbonate soda.....	100 grams.							
Sulphite soda.....	50 "							
Water.....	1000 "							
By Formula 1.....		25	25	25	2	....	14	2½ minutes.
" 2.....		25	25	25	2	....	18	2½ minutes.
" 1.....		25	25	25	....	2	14	2 minutes.
" 2.....		25	25	25	....	2	18	2½ minutes.
" 1.....		25	25	25	....	2	12	
" 2.....		25	25	25	2	2	17	

FORMULAS.				Parts of Pyro Solution.	Parts of Potash Solution.	Parts of Water.	Parts of Excelsior.	Parts Caustic Potash, 50:400 Water.	Parts Caustic Soda, 50:400 Water.	The Picture Appears After Seconds.
<i>Potassium Developer</i>										
	Water.....	500	grams.							
	Sulphite soda.....	100	"							
	Sulphuric acid.....	8	drops.							
3.	Pyrogallol.....	14	grams.	25	25	25	....	....	....	12
	Carbonate potash.....	100	grams.							
	Water.....	1000	"							
	Sulphite soda.....	50	"							Duration of Development, 3 minutes.
<i>Potassium Developer.</i>										
	Water.....	500	grams.							
	Sulphite soda.....	150	"							
	Potassium-metabisulphite.....	5	"							
	Sulphuric acid.....	8	drops.							
4.	Pyrogallol.....	14	grams.	25	25	25	....	....	....	25
	Carbonate potash.....	100	grams.							
	Water.....	1000	"							
	Sulphite soda.....	50	"							Duration of Development, 3 minutes.
	By Formula 3.....			25	25	25	2	....	....	30
	" 4.....			25	25	25	2	....	....	48
	" 3.....			25	25	25	....	2	....	19
	" 4.....			25	25	25	....	2	....	19
	" 3.....			25	25	25	....	....	2	17
										Duration of Development, 2 minutes.
	" 4.....			25	25	25	....	....	2	17
										Duration of Development, 2 minutes.

FORMULAS.				Parts Hydroquinone Solution.	Parts Caustic Soda Solution, 50 : 400 Water.	Parts Water.	Soda Solution. Carbon Soda, 100 grams. Sulphite Soda, 50 grams. Water, 1000 grams.	Potash Solutions. Carbon Potash, 100 grams. Water, 1000 grams. Sulphite of Soda, 50 grams.	Parts Caustic Potash Solution, 50 : 400 Water.	The Picture Appears after Seconds.	Duration of Development.
5.	<i>Hydroquinone Developer.</i>										
	Hydroquinone.....	10	grams.								
	Sulphite Soda.....	25	"								
	Water.....	250	"	10	10	100	.....	.....	.....	39	5 minutes.
	Caustic soda.....	50	grams.								
	Sulphite soda.....	50	"								
	Water.....	100	"								
6.	<i>Hydroquinone Developer.</i>										
	Hydroquinone.....	5	grams.								
	Water.....	125	"								
	Potassium - metabisulphite.....	2	"	10	10	100	.....	.....	.....	46	7 1/4 "
	Caustic soda.....	50	grams.								
	Sulphite soda.....	50	"								
	Water.....	400	"								
7.	<i>Hydroquinone Developer.</i>										
	Hydroquinone.....	5	grams.								
	Water.....	200	"								
	Potassium - metabisulphite.....	4	"	10	10	100	.....	.....	.....	55	10 "
	Caustic soda.....	50	grams.								
	Sulphite soda.....	50	"								
	Water.....	400	"								

FORMULAS.

FORMULAS.			Parts Hydroquinone Solution.	Parts Caustic Soda Solution, 50 : 100 Water.	Parts Water	Soda Solution. Carbon Soda, 100 grams. Sulphite Soda, 50 grams. Water, 1000 grams.	Potash Solutions, Carbon Potash, 100 grams. Water, 1000 grams. Sulphite of Soda, 50 grams.	Parts Caustic Potash Solution, 50 : 100 Water.	The Picture Appears after Seconds.	Duration of Development.
Hydroquinone.....	10 grams.									
Water.....	250 "									
Sulphite soda.....	25 "	10	....	25	75	.....	.....	55	7 minutes.	
Hydroquinone.....	5 grams.									
Water.....	125 "									
Potassium - metabisulphite.....	2 "	10	....	25	75	.....	.....	56	8 "	
Hydroquinone.....	5 grams.									
Water.....	200 "									
Potassium - metabisulphite.....	4 "	10	....	25	75	.....	.....	75	12 "	
Hydroquinone.....	10 grams.									
Water.....	250 "									
Sulphite soda.....	25 "	10	2	25	75	.....	.....	25	4 1/2 "	
Hydroquinone.....	5 grams.									
Water.....	125 "									
Potassium - metabisulphite.....	2 "	10	2	25	75	.....	.....	19	5 "	
Hydroquinone.....	5 grams.									
Water.....	200 "									
Potassium - metabisulphite.....	4 "	10	2	25	75	.....	.....	50	8 "	
Hydroquinone.....	10 grams.									
Water.....	250 "									
Sulphite soda.....	25 "	10	....	25	.....	75	.....	27	5 1/2 "	
Hydroquinone.....	5 grams.									
Water.....	125 "									
Potassium - metabisulphite.....	2 "	10	....	25	.....	75	.....	36	6 1/2 "	
Hydroquinone.....	5 grams.									
Water.....	200 "									
Potassium - metabisulphite.....	4 "	10	....	25	.....	75	.....	72	10 "	
Hydroquinone.....	10 grams.									
Water.....	250 "									
Sulphite soda.....	25 "	10	2	25	.....	75	.....	15	3 1/2 "	
Hydroquinone.....	5 grams.									
Water.....	125 "									
Potassium - metabisulphite.....	2 "	10	2	25	.....	75	.....	16	3 "	
Hydroquinone.....	5 grams.									
Water.....	200 "									
Potassium - metabisulphite.....	4 "	20	2	25	.....	75	.....	47	6 "	
Hydroquinone.....	10 grams.									
Water.....	250 "									
Sulphite soda.....	25 "	10	....	25	.....	75	2	30	4 1/2 "	
Hydroquinone.....	5 grams.									
Water.....	125 "									
Potassium - metabisulphite.....	2 "	10	....	25	.....	75	2	40	5 "	
Hydroquinone.....	5 grams.									
Water.....	200 "									
Potassium - metabisulphite.....	4 "	10	....	25	.....	75	2	64	9 "	

As seen in the tables, experiments were also made with caustic potash, but as they gave less favorable results than caustic soda, and the former being considerably dearer, I would advise only the use of the caustic soda, particularly as

it can be obtained in a much purer state. The caustic potash has frequently an addition of carbonate of potassium.

Finally, it may be said that Dr. Eder's remarks, published in the "*Correspondenz*," agree very much with my observations. *Translated by H. D.*

ELEMENTARY STUDIES IN ORTHO-CHROMATIC PHOTOGRAPHY.

BY HENRY G. PIFFARD, M.D., *New York.*

[Read at a Meeting of the New York Camera Club, January 5, 1889.]

THE fact that red and yellow, both bright light-giving colors, photographed dark, and that blue, a comparatively feeble color, photographed light, has been a prominent obstacle in the path of artistic progress since the first steps were made in the art and science that we seek to cultivate. The many brightly shining flowers, as the rose, the carnation or the tulip, give us images that but faintly represent the beauties with which nature has adorned them; while many of the azure blossoms of the garden or field, when pictured, suggest a sickly ghostliness rather than the beautiful life they represent.

If you inquire why this is so, the scientist will tell you that it is because the iodide and bromide of silver with which photographic plates are prepared are comparatively insensible to the less refrangible, while they are exceedingly sensitive to the more refrangible rays of the spectrum. This explanation, which should be quite satisfactory to those who have been students of science, may not prove perfectly intelligible to such as are not familiar with the meaning of the terms above used. A few words, however, with a simple experiment or two, will render this matter perfectly clear, and plant us on the first step leading to the understanding of the principles that underlie the practice of so-called ortho-chromatic photography.

Experiment I.—If we permit a beam of ordinary light to pass through a narrow slit and fall upon a screen in a darkened chamber we find on the screen simply a narrow band of white light.

Experiment II.—If we now interpose a glass prism between the slit and the screen we find, instead of the narrow beam of white light, a broad band of many colored lights, having red at one end and violet at the other, with orange, yellow, green, blue and indigo as intermediate colors. This parti-colored band is called a spectrum. The rays at the red end, in passing through the prism, are bent slightly out of their course, but less so than any of the other rays, and are spoken of as the rays of least refrangibility; while those at the violet end are bent the most and are called the most refrangible rays.

Experiment III.—If we now put a photographic plate in the place of the screen and allow the spectrum to fall on it for a moment, and then take the plate into the dark room and develop it, we will find that the portion of the plate on which the violet rays rested has been violently affected by the light and develops up black just as if ordinary white light had struck it. This effect of light, however, shades off, and the portions of the plate which corresponded to the green, yellow and red fail to respond to the developer. After the plate has been cleared in the hypo we find that the blue and violet portions of the spectrum have produced the effects of high lights, while the rest of the plate is clear glass. In other words, red, orange and yellow, which are high lights in relation to the eye, are negative in their relation to iodide and bromide of silver, while violet and blue, even a very dark blue, act as a high light in their effect on the chemicals contained in the plate. Hence it is that the ordinary plates of commerce are defective in that they fail to render the colors of the spectrum, and the brilliant colors of nature and of art, according to their correct luminous values.

Such was the state of our art before Ives, Vogel, Eder, Schumann, Mallman, Scolick, Abney and others sought to remedy the defect. These gentlemen have made thousands of experiments, have exposed thousands of plates, and the result has been the birth of a new art, that of ortho-chromatic photography, which,

though in its infancy to-day, promises to create a revolution in present methods as great as that caused by the introduction of the gelatine plate by Dr. Maddox.

In ortho-chromatic photography, Ives worked chiefly with collodion, while the other investigators above mentioned have devoted their energies to the application of ortho-chromatic processes to gelatine plates.

The terms "ortho-chromatic" (literally meaning *correct color*) and "iso-chromatic," meaning *equal color*, are distinct misnomers, inasmuch as this phase of photography has nothing whatever to do with the correct or equal rendering of the colors as such, but simply deals with their luminosity and actinism, and the goal sought is to bring these two qualities into exact correspondence. In other words, to confer a greater degree of actinism upon the more luminous and to restrict the actinism of the less luminous colors.

A more correct term by which to express this phase of our art is the simpler designation, ortho-photographic (meaning correct or true light writing), and the special plates employed may be termed ortho-photic plates.

By means of such plates yellow and red are no longer reproduced as black, and blue as white, but the former appear as high-lights and half-tones, and the latter even darker. This statement alone sufficiently indicates the immense value of the new process as an aid to artistic photography, and a comparison of the results obtained by the use of ortho-photic plates with those obtained on ordinary plates should be sufficient to satisfy the most sceptical, and lead to the almost universal use of the new methods.

A few comparisons between ordinary and ortho-photographs of colored objects will illustrate the differences to which I desire to call your attention.

These illustrations clearly demonstrate that certain plates are very sensitive to the brighter colors, while others are comparatively insensitive to them. The former are commonly called ortho-chromatic or color-sensitive plates, and may be prepared by several different methods, which methods, however, have one feature in common. This common and apparently necessary feature is the addition of certain extraneous substances to the ordinary sensitive emulsion either before or after the plate is coated. There are then two general processes in vogue. The first of these consists in adding the special color sensitizer to the emulsion itself before the plates are coated, and when prepared in this way they may be termed ortho-photic emulsion plates. The second method consists in taking an ordinary commercial plate, bathing it for a few moments in a suitable solution and then putting it away in a dark box until required for use. These may be called ortho-photic bathed plates.

The comparative advantages of emulsion and bathed plates may, speaking from my own experience, be briefly stated as follows:

The emulsion plates are a commercial article being offered by several European and one American maker, and hence can be as readily obtained as ordinary plates. They are reasonably durable. Mr. Carbutt has assured me that his ortho-chromatic plates will keep at least a year, and I have personally exposed these plates which were more than six months old. On the other hand they do not appear to possess as great general sensitiveness as certain bathed plates.

Bathed plates possess the advantage of being quicker, and may be prepared in a few minutes from ordinary plates. By varying the bathing solution quite striking differences in result may be obtained, as I shall presently demonstrate. These plates, however, do not keep well, rarely remaining in good condition more than a few weeks, and some of them are worthless after a very few days.

Quite a number of different substances have been employed with greater or less success in the preparation of ortho-photic plates, especially chlorophyll by Ives with collodion plates, cyanin for increasing the luminous effect of red, and erythrosin and eosin for imparting similar qualities to yellow and green. These two latter substances, however, are the ones that are almost exclusively employed both in emulsion and in bath plates. These substances, when in even very dilute solution, present an intense color, and are dye-stuffs of the highest grade.

Whether used in emulsion or for bathing, the quantity of the substance employed is exceedingly minute. Both erythrosin and eosin are derivatives of

fluorescin, which in turn is a derivative of coal tar. They have a somewhat complex chemical composition, one of them containing iodine and the other bromine. If a dilute solution of either erythrosin or eosin be brought in contact with a small quantity of nitrate of silver, the haloids separate and are replaced by silver, which enters into combination with the remaining elements of the dye-stuff. This gives us two new substances, known as erythrosin-silver and eosin-silver. These bodies are insoluble in water, but if a little ammonia be added they immediately go into solution, with a brilliant red or reddish-yellow color.

These silver compounds are also in use, and we thus have four substances—erythrosin, eosin, erythrosin-silver and eosin-silver—one or the other of which enters into the composition of ninety-nine one-hundredths of all so-called ortho-chromatic plates, whether of the commercial or domestic variety. Almost all of the commercial ortho-plates made in England, France and Germany are made with eosin-silver, which, for reasons that will be given later, I consider greatly inferior to the plain eosin, without silver, especially for landscape work.

This special method of preparation, however, is protected by patent in the countries above named, and the proprietors of the patents spare no pains to puff the merits of these plates and to depreciate the value of other methods of preparation.

I have experimented to a very considerable extent with both eosin-silver and erythrosin-silver, and also erythrosin-eosin-silver, and am of the decided opinion that the addition of silver is decidedly detrimental, the simple erythrosin or eosin giving better ortho-photic results, except when special yellow sensitiveness alone is sought for. As to this matter, I have fully satisfied myself by testing plates prepared in various ways on the solar spectrum, the continuous spectrum, on highly colored natural objects, as flowers, etc., and on pigments. In order to systematize this work, however, I have availed myself largely of an artificial or pigment spectrum prepared and given me by Mr. E. Bierstadt, who, as is well known, has for many years employed ortho-photography in a commercial way. This chart in polychrome displays the principal colors in the following order: violet, indigo, blue, green, yellow, orange and red, and alongside the red he has placed a strip of black.

Upon this color-chart I have exposed a considerable number of plates with results that will presently be shown.

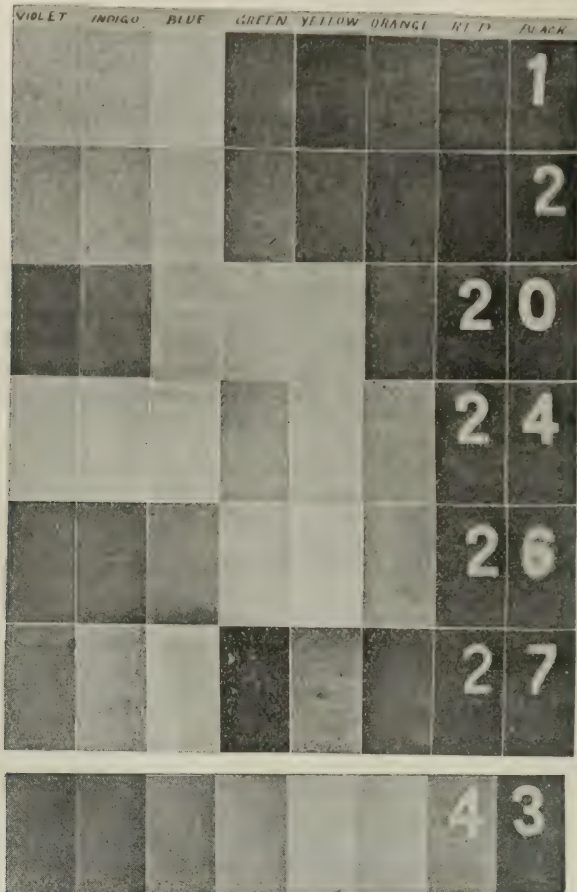
Some of the published formulas for the preparation of ortho-photic plates are needlessly complicated, as for instance the one of Mallmann and Scolick, whose directions are substantially as follows: To a dilute solution of erythrosin add a dilute solution of nitrate of silver. This will produce a precipitate of erythrosin—silver. The fluid and precipitate are then thrown upon a filter, and after filtration the filter is washed a number of times with distilled water, in order to remove every trace of uncombined nitrate, in case that substance should have been added in excess.

The precipitate is then dissolved in water containing about ten per cent. of ammonia. These operations must be conducted in the dark. I have simplified this process by first making a solution of erythrosin, containing about one part of the dye-stuff to two thousand parts of water. One grain of silver is now added for every $5\frac{1}{2}$ grains of erythrosin. This will leave the erythrosin slightly in excess, and does no harm, while if the silver is in excess the plates will fog in development. A small quantity of ammonia is now added until the erythrosin-silver is brought into solution. This formula requires but a few minutes to prepare, while Mallmann and Scolick's takes several hours.

An eosin-silver bath may be made in the same way, except that about three and a half parts of silver-nitrate are used for every ten parts of eosin.

These solutions do not keep well, but in a few weeks become turbid and unfit for use. But as I do not like the results they give, I have abandoned them in favor of the plain erythrosin and eosin solutions. These plain solutions may be made by simply dissolving two grains of either dye stuff in four ounces of water and then adding an equal quantity of alcohol. The solution is now

carried into the dark room and a sufficient quantity is poured into a tray. An ordinary plate is now dipped into the prepared bath and left there for a couple of minutes with occasional rocking. It is then removed and raised up on end in a well-ventilated but absolutely dark closet or cabinet. The lower edge of the plate should rest on a strip of blotting paper. In ten minutes or so the plate is ready for use and may be put in the holders or may be kept in the closet for some hours until perfectly dry. Plates prepared in this manner possess, when fresh, the highest degree of excellence, but may rapidly deteriorate and be useless at the end of twenty-four hours. I think this is due to the varying quality of the erythrosin of commerce, as various samples that I have experimented with differed widely in their physical qualities and in their ortho-



photographic behavior. I regret that I cannot inform you where a perfectly reliable sample of erythrosin may be obtained; but should you get one, cherish it carefully and part with it but grudgingly.

The eosin of commerce appears to be much more uniform in quality than erythrosin, and for that reason I would recommend its use especially in first experiments. There are, however, two varieties of eosin, known respectively as eosin Y (yellow) and eosin B (blue). I prefer the former. Eosin bathed plates have, in my hands, proved more durable than those prepared with erythrosin.

In order to secure ortho-photographic results either on emulsion or bathed plates, it will be found necessary to use an accessory color-screen. This screen may be a piece of suitable yellow glass, or a piece of plain glass coated with yellow

collodion. In the former case the glass should be a yellow pot-metal, not a flashed glass. It should be free from imperfections and the sides should be made plane-parallel and polished by an optician. A yellow collodionized glass may be prepared by first making a saturated tincture of turmeric. To this an equal volume of ether is added, and to this again gun-cotton in the proportion of 10 grains to each ounce of the mixture. A piece of clear glass is now taken and coated with the collodion. When dry it is ready for use, but the collodion surface should be protected by a coating of clear negative varnish.

With all the requisites for ortho-photographic studies at hand I would advise, as a first experiment, the testing of the color-chart with an ordinary commercial plate.

Let the color-chart be placed before the camera in such a way that it is evenly illuminated by good diffused daylight.

If the exposure is correct you will have the result shown on negative No. 1 (lantern slide here shown), in which the light values of the several colors as interpreted by the plain gelatino-bromide plate are :

In the first order of intensity	Blue.
Second "	Indigo and violet.
Fourth "	Green and orange.
Sixth "	Yellow.
Seventh "	Red.

This result I have found constant with every brand of plates that I have tested.

If we now take another of the same plates and interpose the turmeric screen by fastening it to the front-board just behind the lens, and again expose, we will have a slightly different result, as shown on No. 2, as follows :

First order of intensity	Blue.
Second "	Indigo.
Third "	Violet.
Fourth "	Green, yellow and orange.
Seventh "	Red.

We here observe that the effect of the screen has been to depress to a slight extent the intensity of the blue and violet and to increase the intensity of the yellow.

If we now take a plate from the same box and bathe it with an ortho-photizing solution of erythrosin without, however, employing the turmeric screen, we will get results identical with No. 1. In other words there will be no ortho-photic effect whatever, and the same is true with plates bathed with eosin or with a mixture of erythrosin and eosin.

Again, bathe a plate with the erythrosin solution, but this time use the turmeric screen, and the resulting negative will be the first to show ortho-photic, or as it is commonly called, ortho-chromatic results, as on negative No. 20, in which we find the light values to be:

First	Blue, green and yellow.
Fourth	Indigo and orange.
Sixth	Violet and red.

The next experiment may be made by bathing a plate with an eosin-silver solution. When exposed without the screen the result is negative, that is, the same as in No. 1, no ortho-chromatic effect being discernable.

If, however, the turmeric screen be employed, the eosin-silver plate will give the results shown in No. 24, with the light values of the several colors as follows:

First	Blue.
Second	Indigo.
Third	Violet and yellow.
Fifth	Orange.
Sixth	Green.
Seventh	Red.

These two experiments are exceedingly interesting, from the fact that the first negatives the assertion that has been made that ortho-photic effects may

be obtained without the use of a screen; while the second gives even less light value to the green than an ordinary plate does, which makes it a very undesirable plate for ordinary landscape and foliage, that is, if true ortho-photic effects are desired. If you try the plates, however, on landscapes you will find certain very remarkable effects, which have, I think, deceived most observers as to their true character. These effects I shall allude to again.

If we now abandon our bathed plates and try a Carbutt ortho-emulsion plate without a screen, we will get no ortho-photic result; but if we employ the turmeric screen we get a negative represented by No. 26. The light values given by this plate are:

First.....	Yellow.
Second.....	Green and orange.
Fourth.....	Blue.
Fifth.....	Violet, indigo and red.

These results are in striking contrast with, and are in fact almost the reverse of those obtained on plain plates. Another exposure was made with a Carbutt ortho-chromatic, using a screen of yellow flashed glass, and the light values shown in No. 27, as follows:

First.....	Blue.
Second.....	Indigo.
Third.....	Yellow.
Fourth.....	Violet.
Fifth.....	Green, orange and red.

If we now examine these various results side by side, so that they may all be seen at one time, we are immediately struck by the varying results, and ask ourselves which is the truest to nature and which will prove most acceptable as a landscape plate. There was no difficulty in discarding Nos. 1, 2, 24 and 27, leaving the choice between Nos. 20 and 26, with a personal predilection in favor of No. 20. I felt, however, unwilling to trust my own judgment in the matter, and availed myself of the kind offer of the well-known artist, Mr. James D. Smillie, who volunteered to estimate the light values in Mr. Bierstadt's color-chart, and to represent them in black, white and half tone. A copy of Mr. Smillie's chart was made on a plain plate, and is shown in No. 43, with the following results:

First.....	Yellow.
Second.....	Orange and green.
Fourth.....	Red and blue.
Sixth.....	Indigo.
Seventh.....	Violet.

These, it will be noticed, are very similar to those obtained on the Carbutt ortho-plate, as shown in No. 26. To Mr. Carbutt, then, the credit should be given of having produced the best plate for the reproduction of the light values of the principal pigments. For landscape work, however, it is possible that something better may yet be found.

We will now return to No. 24, and review our objection to the use of eosin-silver as an ortho-photizing solution, and again deny the statement that it gives ortho-photic results without a color screen. On near objects we have repeatedly failed to obtain these results, getting nothing more than will be found in No. 1; and when we use the screen we get decided depression of the green, the full light value of which it is most important to secure in most landscape work. What basis, then, is there for the preference which some give to this method of preparation, and what has led them to declare that ortho-photic results are thus obtained? An answer to these questions will be suggested if we make a careful study of the pictures which illustrate No. 375 of Vogel's *Photographische Mittheilungen*, a copy of which I now throw upon the screen. We here have two pictures of a little Bavarian village, the upper one taken on a plain plate and the lower one on an eosin-silver plate used without a color screen. The common features of these two pictures are a plain in the foreground, a few houses and a row of trees in the middle ground and a line of mountains in the distance. Very few persons would hesitate a moment in their choice between them,

and in an instant would pronounce the lower one, the eosin-silver, the better of the two. The difference between the two pictures is certainly very striking, and the almost universal verdict would be that the claims made in behalf of the eosine-silver as an ortho-chromatic plate, *per se*, were substantiated.

If, however, we study these pictures with a view to analyzing the differences that exist between them, we find that the characteristic feature of the eosin-silver plate is the remarkable detail that is present and especially in the background. In the plain plate, the mountains are shrouded in haze, their very outlines being indistinct, while their irregularities or other peculiar features are indistinguishable. They look as distant mountains usually do when viewed with the eye. On the eosin-silver plate, however, these mountains are brought right up to the observer as if viewed with a telescope, and the wonderful detail they possess is as clearly delineated as they would to one who was very close to them and yet at an elevation that enabled him to see them in their entirety. The prominent characteristic of this plate, then, is its remarkable ability to delineate distant detail, a quality, however, which has no relation whatever to true ortho-chromatism; this increase of detail does not necessarily carry with it a true rendering of color values, which is the essence of ortho-photism.

It is the possession of this faculty of delineating detail that has led observers to hastily pronounce these plates ortho-chromatic. As yet no term has been proposed that properly defines this peculiar project. I therefor suggest the word *graphotelism*, as correctly describing the feature under consideration. The plates may, therefore, be called *graphotelic*. If we examine Dr. Vogel's pictures still further, and specially direct our attention to the row of trees in the middle ground, we will find, perhaps to our surprise, that from a strictly ortho-photoc standpoint, the light value of the foliage is not as well represented in the eosin-silver as in even the plain plate, a result which is in strict conformity with the experiment illustrated by negative No. 24.

We must, then, in our study of these specially prepared plates, recognize the fact that there may be exhibited two entirely distinct qualities, namely, graphotelism and ortho-photism, which may exist separately, or be combined on the same plate, but which hereafter should not be confounded.

Turning now from the practical to the theoretical, we may ask: What is the cause that produces the graphotelic, and what the cause of the ortho-photoc effects that may so easily be secured by the simple addition of an extremely minute quantity of certain foreign substances to the ordinary gelatino-bromide emulsion? As regards graphotelism, I feel myself at the moment to be absolutely without a clue to any adequate explanation.

The production of ortho-photism, however, admits of explanation, at least in part. It is generally claimed that it may be brought about by means of a certain limited number of highly colored substances, *e.g.*, erythrosin, eosin, etc. Second, it is asserted that these substances, when examined in solution with a spectroscope, must be capable of exhibiting absorption bands. Third, it is asserted that the position of these absorption bands on the spectrum will correspond with the special ortho-photism impressed on the plate. *Per contra*, it may be asserted that many highly colored substances, whose solutions exhibit marked absorption bands, fail to influence the plate as regards a truer rendering of the light values of the several colors, *e.g.*, carmine and fuchsin. Second, erythrosin and eosin, although different in color, appear to produce substantially the same results on the plate.

It has been further shown by experimenters that an emulsion may be highly colored with one of these substances, and then washed until the last trace of color disappears, and yet it will still exhibit ortho-photoc properties. This led me to suspect that color was not essential to the process; in other words, that it was not necessary to use a dye-stuff. Such being the case, we must seek for some other quality which these two bodies possess in common, and which is not an essential accompaniment of color. We find this in their common property of fluorescence.

We may further recollect that chlorophyll, used by Ives, is also a markedly

fluorescent body, while carmine and fuchsin, both highly colored and giving absorption bands, are not fluorescent and do not ortho-photize. These facts appeared to warrant the induction that the peculiar effects we are studying were related in some way to fluorescence, and led me to experiment with fluorescent but colorless solutions in order to test the validity of the induction. To this end, I bathed an ordinary plate with a dilute solution of nitrate of uranium, and made an exposure, using a turmeric screen, on Bierstadt's color-chart. The result was a negative identical with those obtained with the aid of erythrosin and eosin, and represented by negative No. 20. Another plate was bathed with a solution of æsculin, and gave similar results; while a third, bathed with a solution of sulphate of quinine, responded in the same manner.

The possibility, therefore, of obtaining ortho-photic results with solutions which were not dye-stuffs, and which did not give absorption bands, was thus clearly demonstrated.

Shortly after the above-mentioned experiments were made, I met with an article by Mr. C. Schiendl, of Vienna, and published in the *American Annual of Photography* for 1888. In this article Schiendl says: "I have finally found a large number of colorless substances, as such not being able to give any absorption band at all, but still powerful sensitizers for certain parts of the spectrum (atropia, brucia, quinia, æsculine, salicine, etc.)." From this it appears that Schiendl had already anticipated my own observations, so far as practical results were concerned, and I here desire to give him the credit that is his due.

For bathing plates I used a solution containing one part of æsculin to five hundred parts each of alcohol and distilled water. Whether this substance would act equally well when incorporated with the emulsion before coating remained to be seen. I accordingly sent a small quantity of æsculin to Mr. Carbutt, without informing him as to what it was. He added it to an ordinary emulsion and tested the results, sending me the following report: "In early summer it ought to yield some of the finest landscape effects ever yet secured." He states, however, that the æsculin emulsion, tested with a sensitometer plate, was a trifle slower than an emulsion prepared at the same time, but orthochromatized in his usual way.

Ortho-photography is in its infancy. Its growth, however, has been too much hampered by untenable theories, and its practice has been surrounded by imaginary difficulties; and if this paper will lead you to experiment a little in the directions indicated, I feel sure you will give ortho-photic plates the preference for most kinds of work, and a year from now will be able to show landscape negatives that will surprise those who are only familiar with the results that are attainable on ordinary plates.

I trust that on a future occasion I may have an opportunity of continuing with you our studies in this most fascinating department of our art.

THE LAW AND PHOTOGRAPHY.

BY MR. MORRIS COOPER.

(Read before the Photographic Section of the American Institute.)

WERE that venerable master of the law, Sir Matthew Hale, still among the blessed living, with what curious feelings would he not receive an invitation to hear a paper read on "The Law and Photography." In the exercise of a wise discretion, he might prefer to remain away altogether; but if he came, you may be sure that he would take a front seat, and woe to the presumptuous meddler who should attempt to erect any new idols in the temple of justice. But the times have changed since one of the noblest and wisest of England's judges thought it fit to preside over witches' trials. The art, which in those days would surely have invited the attention of the courts in a very unpleasant fashion, however, has become the helpmate of the law, and in the service of justice is destined to reach a degree of usefulness limited only by the skill and capacity of the artists themselves.

Until comparatively recent times, recorded history consisted of the doings of soldiers, priests and politicians; may we not hope, however, that in the history of the future, the man or woman who can relieve his or her fellows from useless drudgery, give them better food to eat, warmer clothes to wear, sweeter surroundings to live in—in a word, make this earthly life more human, and therefore more humane, will receive a place at least equally honorable with those whom the world has hitherto been pleased to call its heroes? I venture the opinion that the man, or probably woman, who first used soap and taught others how to use it, conferred as great a benefit on the human race, if not much greater, than the boldest warrior that ever lived, though the latter's deeds may have been sung in a hundred Iliads. A few inventions during the latter end of the preceding and in the early part of the present century, and behold! not only a revolution in the industrial world, but almost a new civilization. The tales of the Arabian Nights are indeed a childish affair compared with the wonderful story of human progress in the present age. It is not my purpose to tell this fascinating story to-night, but in the consideration of the subject before us, to emphasize the fact that no one, not even the wildest dreamer, can foretell the uses to which an industrial discovery or invention may eventually be put. It is said that the Bible and Shakespeare have most powerfully affected the Anglo-Saxon race, because they have been so absorbed by that race as to have become a part of its mental habit. Has any one ever reflected how great an influence in the mental make-up of the same race its great mechanical inventions have played? To-day, our thinking, living, love-making, marrying, church-going, and even dying, pre-suppose railroads, printing, steam, applied to a thousand forms of industry, and numberless inventions, processes and discoveries. Simply remember that there was a time when none of these were known, and you can at once see what a part they must have played in the development of the human mind. Not one of the well-known inventions but has introduced a whole series of new problems and new relations, requiring re-statement and re-arrangement from time to time. Of the art of photography it may justly be said that its ways are "ways of peace." Unlike most other great arts, it is not applied to the destruction of life or property. Whether its paths are "paths of pleasantness," you, who are so thoroughly familiar with its technical details, are the best judges. To the courts of justice we must look for authoritative expressions upon the questions to which the art has given rise in commerce and society. I propose this evening to discuss some of the problems relating to photography which, in one way or another, have received the attention of the courts.

Let me say at the outset that the law moves with somewhat measured and cautious steps. This is but natural when we remember that the perfection which the law may have attained in any community, is simply an index to the development of that community. More accurately speaking, it is a mirror, in which all the intricacies and complexities of society are seen reflected. At the threshold of our investigation, let us consider

THE RIGHT TO PHOTOGRAPH AT ALL.

On this question there is as yet very little judicial opinion. Clearly, every one who sees fit may make pictures of natural scenery. The sky, the ocean, the forests and the hills are no man's property. So a person could not be prevented from taking pictures of buildings erected upon land, provided he could get his view without going upon private property. There are objects, however, which cannot be photographed without the consent of the owner; that is to say, conceding an abstract right to photograph, a publication of the pictures or even of the negatives, and a publication would be complete by exhibiting them to a single person other than the one who took them, would be unauthorized. Suppose the rejected suitor of the fair Amanda, by means of a detective camera, succeeds in obtaining a picture of his adored one in the very act of being kissed by his hated rival. Would he be allowed to exhibit such a picture? We think that no photograph exposing others to scorn, disgrace, humiliation or contempt would be tolerated. The fact that the photograph depicted a scene which actually took

place would be no excuse; on the contrary, that very fact would be all the more reason for not countenancing so ungallant a proceeding. Works in which a lawful copyright subsists cannot be photographed without permission. Thus photographs cannot be taken of paintings, drawings or engravings without consent. An interesting litigation illustrating this phase of the subject arose out of the picture called "The Death of Chatterton." Henry Wallis, the artist of this famous painting, sold it to a gentleman who, for a valuable consideration, agreed to sell to one Robert Turner the sole right to make and publish an engraving of the picture, and to exhibit it for short periods at any of the principal towns in Great Britain and Ireland, in order that Turner might obtain subscribers and otherwise derive profit. The picture being thus exhibited by Turner, one James Robinson arranged in his own studio a group which bore an exact resemblance to the picture, and took photographs for the stereo-scope, colored them so as to correspond with the picture and sold them. What did Turner do? Let Robinson have it all his own way and spoil his anticipated profits? Well, not much; he was not constructed that way. He obtained an injunction against Mr. Robinson and the court sustained him. This brings us to another very interesting query.

Who owns the property in a photographic portrait, the sitter or the photographer? This point has been several times discussed in the public journals, but only once, as far as I can ascertain, in court. One able writer took the view that the property was vested in the artist and consequently that he could multiply and sell copies at will. Other able writers have combatted this notion and declare that the right to multiply and distribute copies of the picture belongs to the sitter. The only actual decision which I have seen reported, was given in the *New York Herald* of January 6, 1889, in the form of an editorial. Here it is: "Mrs. Pollard sat for her photograph at the gallery of the photographic company. Subsequently she learned that the company had prepared copies for Christmas cards, and was offering them for sale. She thereupon applied for an injunction to restrain this liberty. The company contended that the negative was their property, and that they had a right to print copies from it for sale. Mr. Justice North decides that a photographer has no such right unless he is expressly or by clear implication authorized to do so by the sitter. He accordingly granted the injunction. Here are the reasons: The object for which a photographer is employed and paid is to supply his customer with the required number of printed photographs of a given subject. For this purpose the negative is taken by the photographer on glass, and from this negative copies can be printed in much larger numbers than are generally required by the customer. The customer who sits for the negative thus puts the power of reproducing the object in the hands of the photographer, and in my opinion the photographer who uses the negative to produce other copies for his own use without authority, is abusing the power confidentially placed in his hands merely for the purpose of supplying the customer. And further, I hold that the bargain between the customer and photographer includes by implication an agreement that the prints taken from the negative are to be appropriated to the use of the customer only."

This decision, it seems to me, expresses the right view upon the subject. A woman's face is her fortune, and why a photographer should, without her permission, be allowed to distribute her photographs is difficult to understand. The mere fact that the photographer owns the negative, and has in his power the means of doing the injury, no more gives him the right to do so than the fact that a printer owns the type from which a book has been printed, affords the latter to multiply copies of the book without the author's permission.

Allied to this part of the subject is the question of

COPYRIGHT IN PHOTOGRAPHS.

Under the American statute of 1861, which provided that any person or persons, being a citizen or citizens of the United States or resident therein, who should invent, design, etch, engrave, work, or cause to be engraved, etched or

worked, from his own design, any print or engraving, and the executors, etc., of such persons should have the sole right of printing, publishing and vending such print, cut or engraving, in whole or in part for the term of twenty-eight years from the time of recording the title thereof, etc., it was decided that no copyright was conferred in photographs, on the ground that photography was not a method of printing within the spirit of the law. In 1865, however, Congress extended the copyright laws to embrace photographs and negatives. Under the present Act, the Law of July 8, 1870 (U. S. R. S., Sec. 4952), any citizen of the United States, or residing therein, who is the author, inventor, designer or proprietor of a photograph or negative thereof, may obtain copyright therein. The term of years for which copyright may be granted is twenty-eight, with a renewal, on complying with certain conditions, of fourteen years more. The matter is in charge of the Librarian of Congress. In a suit brought by Mr. Sarony against a lithographing company for infringement of copyright, one of the questions to be decided was, Has Congress the constitutional power to confer copyright in photographs? The facts were that Mr. Sarony, under an agreement about the month of January, 1882, with Oscar Wilde, made a photograph of that person, which he designated "Oscar Wilde, No. 18." The defendant copied the photographs by means of chromo-lithography. It was contended in court that a photograph was not a writing nor the production of an author, but the court sustained the power of Congress to give copyright in photographs, making it, however, a criterion that the photograph should be the embodiment of original conception, and intellectual production. The claimant, therefore, of a copyright in a photograph under American law, must, in case his right thereto is disputed, be prepared to show that this work, like that of a successful patentee, is a work of originality, intellectual production, thought and labor of his own. In the Sarony case it was shown in respect to the photograph in question that it was a useful, new, harmonious, characteristic and graceful picture, and that plaintiff made the same entirely from his own original mental conception, to which he gave visible form by posing Oscar Wilde in front of the camera, selecting and arranging the costume, draperies and other various accessories, arranging the subject so as to present graceful outlines, arranging and disposing the light and shade, suggesting and evoking the desired expression, and from such disposition, arrangement or representations, made entirely by plaintiff, he produced the picture in suit. The plaintiff succeeded in both the lower and higher courts.

An interesting case arose in England in 1883. The English statute allowed copyright to the "author" of an original photograph, for the term of the natural life of such author, and seven years after his death. The Australian Cricket Team being in England, the manager of Messrs. Nottage & Kennard, a firm of photographers called the London Stereoscopic & Photographic Company, by appointment with the team, directed an assistant to go and photograph them. This the assistant did; thereafter Nottage & Kennard in the usual way prepared and sold the photographs, having previously taken out copyright in their names as proprietors and authors. But the inevitable infringer was abroad. A Mr. Jackson pirated the photographs, and Nottage & Kennard endeavored by injunction to restrain him. This Jackson, however, must have been a good deal like our famous "Old Hickory," of solid and tough fiber. No injunction for him, indeed! He raised the ingenious point that Nottage & Kennard were not and could not be the authors of the photographs. And now the broad foreheads of the English judges were to be wrinkled in wrestling with the knotty problem of who is the author of a photograph. They did wrestle, and this is the result of their wrestling: Jackson bore off the palm. The author, the court held, was the person who took the picture, the person who was most nearly the effective cause of the representation when completed. Justice Field said: "The author of a photograph is the person who most effectively contributed to the result; that is, the person who directed his mind towards and superintended the particular arrangements which have actually resulted in the formation of the pictures; and who that person is, is a question of fact in each

particular case." To show how the judges arrived at this judgment, let me quote from the opinion delivered in the case by Brett, Master of the Rolls. He said: "I confess I have the greatest difficulty in construing this Act of Parliament. Persons who draw Acts of Parliament will sometimes use phrases that nobody else uses. I am speaking for myself only. As to the strangeness of the phraseology it says: 'the author' and so on 'of every original painting.' Whoever in ordinary life talks of the author of a painting? We talk of an artist or a painter. Then it says the author of a drawing. One can easily make out who is the author of a painting. The author of a painting is the man who paints it, and the author of a drawing is the man who draws it. Here we have the 'author' of a photograph. I should like to know whether the person who drew this Act of Parliament was clear in his mind as to who can be the author of a photograph. We understand that all the photographers have come to the conclusion that they are the authors of a photograph; that is, the people who own the machinery, the people who keep the shop, the people who pay the servants; that they are the only persons who are interested in the photograph at the time it is done; they think they are the authors of the photograph because the photograph is made and formed by the work of their mere servants. I cannot tell whether the person who drew this Act of Parliament had that idea or not; but I am not satisfied in my mind that he had, because it is full of difficulties. Here you have merely two gentlemen stated to be the authors. Can two people be the authors of a photograph? It is difficult to say; but if they are, for whose life is it to last—for the life of one of them or for the life of the longer liver, or what? They are the owners of everything about the place, the machinery and everything else, but they may live in Scotland and their photographic shop may be carried on in London. They may live two hundred miles off. Can they be called the authors of a photograph of which they know nothing? It is done by their servants; they may go to the shop once a week, and when they are there they may superintend the operations, though they seldom do, I suppose. At all events, they cannot superintend the taking of all the photographs in their shop. They may have half a dozen studios; they may superintend the taking of a photograph in one place, and they may have a skilled person who superintends the taking of photographs in another place. It would be obvious that they are the authors of a photograph where they are; but are they the authors of a photograph where they are not? Take this very case: It is not pretended that these gentlemen were at the place where the photograph was taken. They were either in London, or fifty miles, perhaps, the other side of London. They send a man to the place. The idea of photographing the Australian cricketers may have been the idea of one of these gentlemen, and he, if he saw the other, may have put it into the head of that other. The man who went was the man who took the photograph. What had he to do? He had to arrange the group, to put them in the right position and the right focus. But he does not do it at all, because there is another man who gets the plate ready, I suppose; and there is another man who, when the thing is ready, takes the cap off. Neither of them forms the picture, because after all, that is done by the sun. As I say, I wonder whether the gentleman who drew this Act of Parliament was clear in his own mind. I do not think he was, and confess I cannot myself be very clear about it. All I can do is to see who is the person who most nearly answers the description of the other things, or the author of a painting, or the author of a drawing. All I can say is, it is not the man who simply had the idea of a picture, because the proprietor may say, 'You go and draw Mrs. So-and-so, with a dog at her feet, and holding a flower in one hand.' He may be two miles away from the place, and he may have given the instructions by letter. The nearest I can come to it is, that it is the person who effectively is as near as he can be the cause of the picture which is produced—that is, the person who has superintended the arrangement, who has actually formed the picture by putting the people into position, and arranging the place in which the people are to be. Although he may only have done it by standing in the room and giving orders about it,

still it is his mind and action, so far as anybody's mind and action are concerned, which are the effective cause of the picture, such as it is, when it is produced. Therefore, it will be a question in every case who that man is. That would be a question of evidence. That would be what my learned brother would call a question of fact. We have not to say in this case who was that man. I suppose it was the principal who was sent down to the place. At all events, it was neither of these two gentlemen who are described as authors, and it was certainly not both of them. Therefore the author here is wrongfully described, and the registration is bad and the copyright does not exist."

(*To be continued.*)

COLLODIO-BROMIDE EMULSIONS.

BY F. C. BEACH.

[Read before the Society of Amateur Photographers of New York.]

(*Continued.*)

Mr. L. C. Laudy, of the American Museum of Natural History, Central Park, New York, a well-known worker in the collodion processes, has at my request kindly given me a formula which he obtained from Mr. Newton, and which he says at the time it was used they kept secret.

He says they regarded Mr. Newton in those days as the "shining light" in this country on collodion emulsions. The formula is very practical and gave beautiful results, and all looked for a great future in collodion emulsions, until one day gelatine emulsions appeared and the glory of the beautiful collodio-emulsion departed. The following are the particulars as given by Mr. Laudy :

For Newton's emulsions, use Hance's delicate cream cotton.

BROMIDE EMULSION.—Formula for 1 ounce.

Silver nitrate 18 grains to the ounce. First dissolve in ten drops of water, then add five drops nitric acid for each ounce of solution, then add half an ounce of alcohol, in which is dissolved 12 grains bromide cadmium; then add 6 grains of cotton; shake well and add half an ounce of ether; let it stand twelve hours, then add 4 grains chloride calcium.

BROMO-IODIDE EMULSION.—Formula for 2 ounces.

Silver nitrate (crystals) 30 grains, dissolved in twenty drops of warm water, then add ten drops nitric acid.

Alcohol.....	1 ounce.
Bromide cadmium.....	18 grains.
Iodide ammonium.....	2 "
When these are dissolved add cotton.....	12 "

then add the silver solution and shake well; then add 1 ounce of ether and let it stand twenty-four hours; then add 8 grains of chloride cobalt, dissolved in a little alcohol. If the iodide is not used, let the amount of silver be 28 grains, and add the chloride cobalt after the emulsion has stood for sixteen or eighteen hours. Plates thus made with this emulsion may be at once exposed in the camera after coating and be developed with the following developer:

Make a saturated solution of neutral oxalate of potash in water, then add to each ounce 15 grains of pulverized protosulphate of iron, and lastly, just enough citric acid to the solution to turn litmus paper red.

But if the plates are to be preserved in a dry state they should be put in a special solution made as follows, and called

JAPAN TEA PRESERVATIVE.

Saturated solution Japan tea in alcohol.....	1 ounce.
Water.....	16 ounces.

The tea solution is prepared by soaking 1 ounce of Japan tea in 6 ounces of alcohol; let it stand until a strong tincture of tea is made, then add 1 ounce of the tincture to 16 ounces of water. Or better, make a saturated tincture of tea in

alcohol, and add two or three drops to each ounce of bromide emulsion. After coating, simply wash the plates in one or two changes of water until the oily lines disappear and rear up to dry.

To make the plate more sensitive, when it is desired to expose it in the camera, while wet flow over the surface the following accelerator:

Sal soda.....	180 grains.
Bromide of ammonium.....	2 "
Water.....	12 ounces.

Mr. Laudy has also sent me a copy of Mr. Newton's printed directions concerning the use and manipulations of the plates. His developer, called a stock solution, is prepared as follows:

Yellow prussiate potash.....	1 ounce.
Carbonate of soda.....	100 grains.
Bromide of ammonium.....	15 "
Water.....	10 ounces.

After exposure the plate is washed under the tap a few moments to remove the preservative, then the developer, consisting of half an ounce of the above solution, to which 4 grains of dry pyro has been added, is poured on. The image soon appears, and the development is accelerated by the air by frequently pouring the developer off and on. If more intensity is desired add to the developer a little more pyro. Fix in hypo solution, 1 ounce of hypo to 4 ounces of water; give the plate a good washing and set up to dry. When dry, varnish the plate to protect the film.

Dr. J. J. Higgins tells me the formula he used successfully is that which was employed by Mr. Albert Levy, and known as Levy's emulsion.

In the *Photographic Times* of September 4, 1885, Mr. Levy thus describes his method of working.

I will explain the manipulations in the way I think is the most practical, and by following them closely success will be certain; for 54 ounces of emulsion mix the following:

A.

Bromide of cadmium.....	648 grains.
Alcohol (absolute).....	18 ounces.
Iodide of ammonium.....	161 grains.
Cotton (Hance's cream).....	586 "
Ether (concentrated).....	27 ounces.

In another bottle:

B.

Nitrate of silver.....	600 grains.
Alcohol.....	9 ounces.
Nitric acid.....	270 drops.
Distilled water.....	360 "

Pour A into B, and leave exactly ten hours, then add 99 grains of green chloride of copper.

The excellent flowing qualities of my emulsion, its sensitiveness, etc., I ascribe, first, to the minimum quantity of water I put into it, and also to the correct measurement and timing.

First.—I would advise to weigh out the required quantity of bromide of cadmium, and then desiccate this in a porcelain capsule on a gentle heat. It will first soften and boil, and the heat must be applied so that the bubbles do not blow out any of it and change the quantity, however small the loss, as every particle is closely calculated. Then it will form in a lump (I forgot to say that during this evaporation the bromide should continually be stirred with a strip of glass, so as to prevent its adhering and consequent burning), when, by continuous stirring, it will granulate, and this should be pursued long enough, until the granulation is fine enough and powdery, showing that all the dampness has gone.

This powder, well scraped out of the capsule, is put into one-half of the given quantity of alcohol and shaken until well dissolved. The iodide of ammonium is now added. This should be of a light yellow color. When this is melted,

add to it the cotton and shake well, after which the ether is added, and another good shaking given.

This first operation in one of the bottles previously well cleaned. It is well to have the bottles about twice as large as necessary, as it allows better shaking, and, of course, mixing.

In the second bottle put the nitrate of silver, and the water (which must be counted by actual drops, and not measured), the actual amount of which must dissolve the silver; but as it will not do it while cold, it must be gently heated until the required result, when the second half of the alcohol is added. On a small quantity the addition of the alcohol leaves the solution transparent, but on a larger quantity the silver is precipitated. This does not in any way affect the result.

All of these manipulations may be performed in full daylight, but the subsequent ones must be done in the dark room.

After having well shaken the silver solution, add to this the collodion in small quantities of 4 drams to an ounce at a time; shake very well at every new addition, until all is transferred.

The emulsion is now almost finished, and should be shaken occasionally during ten hours (exactly, neither more nor less), when the chloride of copper is added, giving a thorough shaking again, so as to dissolve it well, and also for other reasons.

Before adding the chloride of copper it must be put in a capsule and well evaporated. This can be easily perceived by the color, which must be thoroughly brown when fully dried. Contrary to the bromide, the chloride should and must be weighed after the drying process is gone through. I may add that the dried chloride will keep very well in that condition if placed in a well-closed glass stoppered bottle. If it gets green it must be again evaporated.

Filtering is now advisable through Japanese filtering paper or cotton, when the emulsion is finished. The preservative is composed as follows. Preservative or 44 ounces :

Tincture nux vomica.....	100 drams.
Tincture scillæ.....	42 "
Tincture cochineal.....	120 "
Honey.....	20 ounces.
Acetic acid.....	20 drams.

Of the above take 22 drams and add 64 ounces of water. After coating the plate, allow the film to set well, and then rinse in water before applying the preservative.

On reference of the above to Dr. Higgins, to whom through a perfected formula the honor of the commercial introduction of dry plates in this country is due, he endorses it as in the main correct; the time for the introduction of the nitric acid and its effect, a very important matter, is however wanting, as also other details necessary to its successful making. These the doctor has promised to give, in a practical demonstration before our Society, of the art of emulsion-making, to the utmost minutia, so that any one with ease and certainty can make a reliable and satisfactory emulsion.

Dr. J. J. Higgins also gives me his formula for developing the above plates as follows :

Carbonate soda.....	$\frac{1}{2}$ pound.
Ammonium bromide.....	640 grains.
Honey.....	1 ounce.
Water.....	2 quarts.

The above is strong for extra cases. When diluted one-half it forms the usual normal developer.

To half an ounce of the above add a mustard spoonful of dry pyro previous to applying to the plate.

It will be observed in these various formulas that considerable restrainer is added to prevent fogging, which is quite different in the case of the gelatine plate. If the alkali and pyro are poured on a collodion plate without containing a

restrainer, the film will darken almost instantly. Very little practice is required to obtain excellent results, and I hope the reviving of this subject may lead to further improvements, especially when it is noticed that collodio-emulsions for ortho-chromatic work is being agitated.

AMATEUR EMULSION MAKING.

BY E. H. LYON.

[Lecture delivered before the Boston Camera Club, December 10, 1882.]

WHAT a marvelous thing is the modern dry plate ! What wonderful possibilities are contained within its creamy film ! Does not the development of the latent image savor of the supernatural ?

Our life is made up of images—home, wife, children, friends, town, country—and yet how imperfect are the images stored away by memory compared with those we may produce by the aid of photography ! May we not call a dry plate a sort of portable memory ?

I think the three inventions of modern times which associate themselves most closely with our inner lives are the telephone, the phonograph and the gelatine dry plate, the first bringing us far-distant human voice, the second embalming that voice, so we may reproduce it at will and the third preserving for us a visible image of the speaker and his surroundings.

A dry plate emulsion consists essentially of a finely divided precipitate of bromide of silver suspended in gelatine. This precipitate is formed by the addition of nitrate of silver to a solution of gelatine containing a soluble bromide, generally of an alkali metal, such as potassium, ammonia, sodium or lithium.

It is needless to say how extremely sensitive this precipitate is to light, but we do not know as yet why it is so. We only know that the molecule is capable of reduction in direct proportion to the extent of its bombardment by light waves. The making of a dry plate is not nearly so difficult an operation as many suppose. I consider the correct exposure and development of the plate the more difficult of the two. Of course, I am not speaking of the marvelously rapid plates of the regular manufacturers, whose carefully guarded secrets cover processes of considerable intricacy and nicety of manipulation. By the formula I will demonstrate to you this evening you can easily make plates that will give excellent negatives with an exposure of two seconds, stop F. 45, upon an open landscape in June. Good drop shutter work may also be done with them. I am convinced by long experiment that the emulsion should be made with a view to the work for which it is intended and that it is an impossibility to make a really good "all around" plate. I have frequently noticed that a plate that will give good results in the studio will be supersensitive to diffused light on landscape work, causing distant objects to disappear in fog in order to get sufficient exposure in the foreground. I often hear it said that commercial plates all have chemical fog, that the shadows are not clear glass, and yet you will notice that any part of the plate that has not been exposed at all to light will be clear glass. What ordinarily appears like chemical fog is really the effect of diffused light upon the gelatine. This will frequently occur when the light has been too weak or the exposure too short for direct reflections from objects to impress themselves upon the plates. You may try an interesting experiment to prove this by opening the door of your dark room so that a little diffused white light may fall upon

half of a dry plate, place in weak developer for a few moments and fix. Exposed half will present a mealy, ground glass appearance without apparent reduction of silver, while the unexposed half of the plate will be clear glass. Therefore a good landscape plate must not be too sensitive to diffused light, but it should be highly sensitive to reflected light from different objects and give a good rendering of color values. For general landscape work I prefer a pure bromide to an iodo-bromide emulsion. For interiors and portraiture, a small percentage of iodine is indispensable, as it increases the color sensitiveness for yellow and red. Of course, my remarks apply largely to the ammonia process of dry plate making. I have experimented with nearly all the published formulas and find that the ammonia process is the most reliable and by far the simplest method which the amateur can attempt, although I find many who are in favor of the boiling process. There is much difference of opinion in regard to the use of iodine in emulsions. With pure bromide I find greater latitude of exposure. I have not found any gain in rapidity for landscape work to result from the addition of iodide in the ammonia process. If two plates are exposed in actions upon the same landscape, one pure bromide and the other iodo-bromide, they will be found to have correct time upon about the same section. It will be noticed that over-exposure on the pure bromide only increases density through a considerable range, while over-exposure on the iodo-bromide plates will quickly result in a flattening of the lights. I will explain what I mean by exposing the plate in sections. Mark a plate-holder slide in sections of a half inch and number them; put a plate in and expose the whole of it for one second; push the slide in half an inch and expose another second and so on, being careful not to jar the camera. On developing the plate, it will be seen at once which gives the clearest and best result. The correct exposure for that particular plate or emulsion will be equal to one of the short exposures on that section.

The mixing and digesting of an emulsion are the simplest parts; the troubles are likely to come after this, and are caused principally by the improper application of new gelatine. We are likely to seal up the delicately poised molecule we have produced, rendering it insensitive and difficult to reduce. I will show you how to make an emulsion which, for simplicity and excellency of results in landscape work, I think it is unsurpassed by any of the rapid commercial plates. It is made by the ammonia process. As there is a good reason for each step in the process, the directions given should be closely adhered to. Here is the formula :

A.

Ammonium bromide.....	30 grains.
Nelson's No. 1 gelatine.....	5 "
Distilled water.....	4 drams.

B.

Nitrate of silver.....	45 grains.
Distilled water.....	4 drams.

Precipitate and redissolve with strong ammonia.

C.

Hard gelatine (Heinrich's or Winterthur's).....	30 grains.
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This is the way I mix the emulsion. Place the hard gelatine C in sufficient distilled water to cover it, and set aside to swell for one hour. Now

take a wide-mouthed 8-ounce bottle and put in 4 drams of distilled water and 30 grains of bromide of ammonia; let this dissolve, and then put in 5 grains of Nelson's No. 1 gelatine, taking care that the solution covers it. Set this A solution aside to swell for one-half hour.

To prepare solution B, weigh 45 grains of nitrate of silver, and dissolve in 4 drams of distilled water; add, drop by drop, enough strong ammonia to just redissolve the dark brown precipitate of ammonia-nitrate of silver. If an excess of ammonia has been added, it should be allowed to pass off into the air before the solution is used. The solution should have only a faint odor of free ammonia. Now pour the excess of water from the hard gelatine C and dissolve in a covered beaker or tumbler, at 120 degrees F., in the water-bath. Then place the bottle containing the bromized gelatine in the water-bath and dissolve at 100 degrees F. The bottle should be provided with two corks, in one of which a small glass syringe is fitted. All operations up to this point may be conducted in white light. We must now work by the light of the ruby lamp, which may also serve to keep the water-bath warm during digestion. Let the A and C solutions fall to the temperature of the room, and add B to A, a little at a time, by means of a syringe, at the same time shaking the bottle. Now pour in C, thoroughly mix and place the bottle, which has been closed by cork No. 2, in the water-bath at 100 degrees F., to digest for one hour. It should be shaken frequently during that time to prevent the formation of a coarse precipitate. A thermometer should be the inseparable companion of the bottle in the ammonia process, and the temperature closely watched. A cheap thermometer without a case serves the purpose. The lower portion of it is wrapped with two thickness of flannel, and a strong rubber band fastens it to the outside of the bottle. Do not allow the temperature to rise above 100 degrees F. during the digestion. This is very important, for at high temperatures ammonia is destructive to soft gelatine and it appears to convert hard gelatine into a leathery compound which retards or entirely prevents the subsequent ripening of the emulsion. We may allow ourselves plenty of non-actinic light while mixing and during digestion. After washing and during the coating, we should be more careful. The process of digestion may be watched by placing a drop of emulsion upon a piece of glass from time to time and examining it by transmitted light. When first mixed it will have a salmon color, changing to blue and finally to a blue-green. It should now be poured into a shallow dish to cool. This will take about an hour. When firmly set, take it up with a silver spoon and squeeze through a piece of embroidery canvass into a dish of cold water. A large yellow bowl is useful for this, as the shredded emulsion may be readily seen by ruby light as it settles to the bottom.

Keep the shreds in motion with a glass rod; allow them to settle every few minutes, and pour off the water, replacing it by fresh. Repeat this operation seven or eight times during twenty minutes and the washing will be quite complete.

Pour off as much as possible of the last wash water and add one-half ounce of alcohol to each ounce of emulsion. Let the shreds stand in this dilute alcohol for some minutes, then pour the whole upon a piece of soft muslin stretched across a deep dish or bowl; gather up the corners of the muslin and squeeze the shreds as dry as possible. Now spread the muslin upon the bottom

of the washing dish, and with a silver spoon gather up the shreds and place in a cup or glass and remelt at 100 degrees F. Then set away in a cool place to ripen for from one to five days. The addition of alcohol to the last wash water accelerates the ripening process.

(To be continued.)

OUR ILLUSTRATION.

THE picture with which we illustrate this issue of the BULLETIN marks an era in photographic progress. For many years, ever since Scott-Archer used collodion, glass plates have held undeniable sway as a support for the sensitive surface in photography. The picture that forms the frontispiece of this number of our journal was made from a negative that is not glass nor yet paper; but a transparent medium, not much thicker than heavy note paper, almost as transparent as glass, and from its extreme thinness it has very little weight.

It can be used as readily as a glass plate, being quite rigid; it is placed in the ordinary plate-holders with a card behind it to press it forward into position; it is exposed, developed, fixed, washed and dried as readily as a glass plate. From the result we give in our illustration, it will be seen that there is entire freedom from grain, and it is beyond question a perfect substitute for glass in photography.

The picture is a view of the house of Mr. F. J. Griffiths, at Roseville, New-ark, N. J., the negative being developed by Mr. E. B. Barker, using Anthony's hydroquinone developer.

LAST year I entered my name on your list as a subscriber to your valuable BULLETIN, sending one dollar for trial, and I have found it so useful and its contents of reading matter so choice in selection, that I have considered it in my favor to still remain a subscriber.

BENJ. L. NOYES.

I CANNOT do without it; I cannot tell you how much I was pleased with the BULLETIN this year, and you improve it every year.

EDWARD LONG.

THIS is now my fifth year as a subscriber to the BULLETIN. I am well pleased with it.

A. L. COLTON.

I AM more than pleased with the BULLETIN, and I thank you for sending it so promptly, for I often find in its pages something of real value to me in my everyday work.

MRS. MARY A. CROSS.

I INTEND to take the BULLETIN right along, as I cannot get along without it, for I look forward to it as I do to my meals.

J. M. STROCK.

CANNOT keep house or photograph without the BULLETIN. It is the acme of all photographic journals and the focus of information for the beautiful art.

W. D. LINN.

I WOULD recommend all who wish to do good to subscribe for the BULLETIN, to pay for it, to read it, and to think over what they read.

A. J. PERKINS.

ANTHONY'S Photographic Bulletin.

EDITED BY

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E. & H. T. ANTHONY & CO., Publishers.

PHOTOGRAPHIC SOCIETY OF CHICAGO.

AN adjourned meeting of the Photographic Society of Chicago was held at No. 96 State street, January 16th. Professor Hough presided and C. Gentile acted as Secretary.

The following officers were elected for the ensuing year: President, Judge J. B. Bradwell; First Vice-President, Professor G. W. Hough; Second Vice-President, C. F. Charles; Executive Committee, M. J. Steffens, George Kleine, and Frank Place; Treasurer, G. A. Douglas; Secretary, C. Gentile.

There was a long discussion affecting the proposed holding of an annual exhibition. It was agreed to hold such an exhibition here some time during the month of April. The exact time could not be agreed upon, as that depends largely upon the number of pictures that will be received and the hall in which they will be placed. An offer was received from the management of the Art Institute, tendering the use of three upper galleries. The offer will be further considered. It was decided to make the exhibition an international affair and to give prizes, medals and diplo-

mas for the best exhibits. The newly-elected officers are to be the committee on exhibition. It is expected that the exhibition will be a very large affair, and that it will attract considerable attention. It was also decided to incorporate the society under the laws of the State of Illinois. There was a long discussion on the merits of magnesium flash light, also on the merits of different developers, especially that of the new one, hydroquinone.

CHICAGO LANTERN SLIDE CLUB.

DECEMBER 18, 1888.

A LARGE and appreciative audience filled the club rooms to enjoy the treat assured by the call stating that the Interchange set from the Philadelphia Society was to be shown. Owing to this fact, *President NICOL* announced that the Executive Committee had decided to omit the general business, except the admission of new members. The following names were added to the roll by unanimous vote: Mr. and Mrs. W. C. Comstock, Mr. W. C. Dow, Mr. H. K. Hibben and Mr. E. W. Farnham. A fine double lantern sent to the club by the McIntosh Optical Company was lighted, the lights put out and upon an 8-foot screen appeared the first picture, one of those inimitable compositions by Mr. John Bartlett, entitled "Market Day."

This was followed by a few more by the same artist, child portraits in pretty combinations, all of which brought forth applause.

Following these were beautiful landscape views by Messrs. George Vaux, Jr., Mr. Pancoast, Robert S. Redfield, C. W. Millar and J. G. Bullock. Here the Secretary announced that there was a good collection of foreign views, and he had taken time to arrange them so as to give the members a little trip into France, Italy, Switzerland, Bavaria, Belgium and home *via* New England. Mr. Ellerslie Wallace had one of those beautiful views in the Garden of Versailles, Quaint Old Houses in Hildesheim, the Hotel Kaiserworth on Goslar. Then a beautiful view at Hospenthal and Andermat in the Alps. Messrs. T. N. Ely and W. A. Bullock had some very interesting views in Venice, nearly all taken with detective cameras.

Mr. George B. Wood's Negro in the Doorway, and Mr. Redfield's Victuals and Drink, Nos. 1 and 2, brought out a burst of laughter. Again our club has to thank the Philadelphia Society for as rare a treat among pictures as we have had since our organization.

W. A. MORSE,

Secretary.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

CLINTON HALL, 19 ASTOR PLACE, NEW YORK. REGULAR MEETING, JANUARY 16, 1889.

President H. J. NEWTON called the meeting to order and said: "The first business of the section is reports of committees."

The *Secretary* reported the receipt of the usual photographic papers and periodicals, all of which were duly acknowledged by the accustomed vote of thanks. The chairman of the Executive Committee reported that at the next regular meeting, February 5th, the section would be entertained by Dr. Milton J. Roberts on the subject of "Flash-light Photography in its Relation to Medicine and Surgery."

On the third Wednesday evening, February 20th, there would be an informal meeting of the section, to which all interested in technical photography were cordially invited. (All refreshments on this occasion will be provided by the institute.)

The subjects of the evening were then read as announced on the cards of invitation, and President Newton introduced Mr. Morris Cooper, of the New York Bar, as the first speaker of the evening, who spoke upon the subject of "The Law and Photography."

Mr. Cooper was listened to with marked interest and attention, and his inspirational and effective reading, in unison with the substance of the paper, drew from his auditors at its close a hearty and well-deserved vote of thanks.

Mr. F. C. BEACH, ex-President of the New York Society of Amateur Photographers, followed Mr. Cooper with a lantern exhibition, entitled "A Four-Mile Carriage Drive." He also exhibited a number of slides received from distinguished American and English amateurs, and thus gave his audience the opportunity of better judging the real merit of his own work. That this work was not lowered in the opinion of his auditors by this comparison, was manifest by their hearty applause, and by a unanimous vote of thanks. That Mr. Beach was mindful of the respect due to his audience was apparent by his thorough preparation and unique description of his work, thus demonstrating, unconsciously perhaps, the enhanced pleasure of a lantern exhibition, when every picture is duly and expertly described.

It might naturally be presumed that "A Four-Mile Carriage Drive" would be quickly

over! And it no doubt would have been by one who has no eye for the sublime and beautiful in nature. But the artist may find, even in this short space, sufficient to occupy both hand and brain for as many days as are numbered in the year, and require to faithfully describe and portray these beauties an entire season of winter evenings, rather than one brief hour in a single night.

President NEWTON exhibited some three or four slides illustrative of what can be accomplished in the way of negative-making, even on the shortest and darkest days of the year, and thus demonstrated that the time had come when the amateur could no longer excuse his indisposition by affirming that the only time for viewing was on bright days and genial seasons of the year.

The exhibition was closed with a few choice slides contributed by Mr. A. D. Fiske, and a vote of thanks was tendered him for his expert and skillful management of the stereopticon.

The section, on motion, then adjourned.

BOSTON CAMERA CLUB.

A SPECIAL meeting of the club was held on Monday evening, the 21st inst., to witness a demonstration of the Reeves magnesium lamp.

There was a large attendance, and considerable interest was manifested.

Mr. Reeves exhibited a large number of photographs, interiors, groups and portraits, made with the lamp, which were very good and some of the groups extremely fine.

He then explained the construction of the lamp and the method of using, which is very simple.

The advantages claimed for it are absolute safety, absence of smoke, quickness of the flash, economy, the great breadth of the flame and consequent diffusion of light.

Mr. Reeves then proceeded, with the help of members, to make some portraits.

The first was made with one lamp, unscreened, about 8 feet from the sitter. The lens was a No. 2 Euryscope, large stop. On developing the picture, it was found to be decidedly over-exposed. A second, exposed under similar conditions, but screened, was developed into a well-exposed negative by the use of a hydroquinone developer. A third exposure was made with a double-view lens of 12-inch focus, stop $f/16$. This was a large head on a 5 x 8 plate, and was a splendid negative, fully timed, and with all the qualities of a daylight picture.

The screen used in the second and third exposures was a piece of tracing cloth hung at an angle of about 45 degrees and 3 feet from the lamp. The demonstration was very successful and of great interest to the large company present.

E. F. WILDER,
Secretary.

A COOK-BOOK, A FAMOUS PHOTOGRAPHER, AND A BOSTON HOUSEWIFE.

SOME time ago our good friend, Mr. J. F. Ryder, of Cleveland, sent us a little cook-book, which was partly an advertising device and partly a very useful little compendium of receipts for the housewife. Mr. Ryder also sent a copy of the same volume to Mrs. Conly, the good wife of the well-known Boston photographer. The extracts from her letters which we give below are such thoroughly enjoyable bits of household philosophy that we thought they would interest those of our readers who are fortunate enough to be acquainted with the lady who penned them, she having kindly given her consent to their publication. To understand the situation it must be noted that Mr. Conly was assistant to Mr. Ryder many years ago and the friendship then formed is still strong between the families.

In her letter acknowledging the receipt of the cook-book, Mrs. Conly says: "Mr. Ryder, you are the biggest friend in the West. I have an only brother in the West, but he never sent me a cook-book. He might send me ducks or grouse or some kind of wild hens, but it remains for you to fill my heart with gratitude by this gift of a book. * * * I have a drawer full of cuttings from papers, all cooking formulas, and the moment I get an hour off or a Sunday at home, I cook and have a picnic. I ought to be a regular kitchen girl, but I have to drop my lofty ambition and stand behind a counter and say \$8 a dozen like a parrot, instead of cooking up good things. * * * Well, Mr. Ryder, I must be excused, for I want to read my new book. There isn't any use; I'm going to cook something on Sunday or die in the attempt. The last attack I had I made thirty-nine tumbler of jelly, and have sent it to the sick people. They say it is good, but sick people are often weak mentally. I am going to make a Christmas pudding, and I am crazy to get about it right away."

Mrs. Conly made some Christmas puddings and sent one to Mr. Ryder, with the advice:

"If there isn't a competent doctor within easy running distance, you might have your regular medical adviser to dinner with you. I made one for my family, and if the journals come out with obituaries next month I will be the cause of it." Mr. Ryder says that he received the pudding and that it was "delicious to a dangerous degree."

When a lady as busy as Mrs. Conly can sit down and write so cheerfully about her household affairs, we think it should be an example to many others in a similar position. Lately she has been taking the place of the forewoman in Mr. Conly's studio, this latter lady having been sick for many weeks with typhoid fever. In this connection, Mrs. Conly complains that she cannot get a good girl to help her and remarks: "They don't seem to know that nice people need nice treatment."

The lady whose letters we have quoted from has always taken an active part in Mr. Conly's work, as can witness many letters we have received from her pen; and the success of Boston's well-known artist-photographer is probably due to the fact that he has such a good and happy helpmate. A man with a wife that is interested in his pursuits, and that can at the same time turn her attention to the cooking of a good dinner when necessary, is to be envied. For it is too true that the way to a busy man's heart is by a good dinner. Slippers and smoking-caps are pretty in their way, but a dinner well cooked, and the cook at the other end of the table, makes a man feel supremely happy.

Bibliography.

THE *Photographic News* Year-book of Photography comes to hand rather late this year, but it is filled with good things for the photographer. It has over two hundred pages of photographic information, including tables of societies, formulas, receipts and other useful memoranda.

AN INTRODUCTION TO THE PRACTICE OF PHOTOGRAPHY. By Chapman Jones, F. I.C., F.C.S. London: Iliffe & Son, Fleet street.

In spite of all that can be said to the contrary, a good chemist is the best man to write a book on photography. Such a writer is the author of the volume before us. It is practical, truthful, in that it is scientific, and therefore is thoroughly reliable. In the compass of two hundred and seventy odd pages the

author discusses such topics as the chemical action of light, the nature of a number of photographic chemicals, the intensity of light, mirrors, lenses, color sensitiveness, cameras, stands, shutters, making negatives, developers, intensifiers, gelatine-bromide paper, collodion plates, silver and other printing, and also brief chapters on some photo-mechanical processes. Altogether the book is an admirable compendium of photographic practice.

DIE BROMSILBER-GELATINE. Dusseldorf :
Dr. Paul E. Liesegang.

This is the sixth edition of this neat and practical little manual. In it the author discusses the history of the gelatine process; the making of emulsions; all the details with regard to the preparation of the glass plates; the development of the negative; the different kinds of developers; the fixing, washing and strengthening of the negative; the direct reproduction of pictures, and a host of other information, the result of practice from a worker in photography. The volume is a good one, and those of our readers who understand the German language will find it useful.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. R. C. writes: Please tell me, through the columns of the BULLETIN, if there is a book entitled "Skylight and Dark Room"? If so, where can it be procured? The hydroquinone developer, in Dr. Vogel's letter in No. 24, gives French weights; what would the proportions be in English weights? I have been using Cramer dry plates; are they as good as the Stanley? Is it cheaper to make my own chloride of gold, as per formula of T. J. A. in BULLETIN No. 24, or get it dry already prepared?

A.—We do not know a book by the title you give. But you cannot do better than read the articles of Mr. Duchochois in the recent numbers of the BULLETIN; these discuss the subject quite thoroughly. In all foreign formulas, it is only necessary to remember that the gram is equal to 15.4 grains and the c.c. of water weighs one gram. The question about plates we do not care to answer; it would be

too much like advertising. Both plates are good, but everyone cannot use them; it takes experience. Don't try to make gold chloride; the process is too troublesome; it is better to buy it dry.

Q.—J. F. L. writes: Will the BULLETIN please explain the illustrations of the Lick telescope? Are these two mountings for the 36-inch lens under different devices, making it necessary to transfer the lens from one to the other as the occasion requires?

A.—We do not understand that the Lick telescope has two mountings. The cuts given are from views with lenses of different angles, in order to show the whole instrument and also the details around the eyepiece end.

Q.—N. F. A. writes: Will you please answer through the BULLETIN what can be used to keep the albumen on the paper in place of silver or alcohol? Do not want to print on paper.

A.—Hold the paper over a jet of steam issuing from an opening that does not throw out drops of water. A flat, wide jet is best, and the paper must be moved rapidly and uniformly over it.

Q.—C. A. B. writes: I send you a piece of albumen paper that, after floating on a 60-grain bath one and a quarter minutes, has dark spots on it in various places and shapes. My bath is clear and apparently free from albumen; usually the second sheet floated is all right, but sometimes has tears. I use N. P. A. paper. My prints, after burnishing, seem to have a scum over them in the heavy shadows, and the whole picture seems muddy. And another thing that don't seem right: after fixing, the print looks grainy, as though the fiber was totally destroyed. What is the best method of ridding the bath of albumen? Please answer the above through the columns of the BULLETIN.

A.—Your trouble seems to be that a scum settles upon your bath. This may be almost imperceptible to the eye. To overcome the difficulty take a piece of clean filter paper, or blotting paper, and draw it over the surface of the bath before floating the albumen paper. To overcome the grain difficulty the paper should be hung in a damp atmosphere about twelve hours before floating, and should also be thoroughly fumed. To rid bath of albumen make it alkaline with ammonia, place it in sunlight until all albumen has precipitated, then boil, filter, neutralize with pure nitric acid, and if the strength is right, it is fit for use.

Views Caught with the Drop Shutter.

USING A SPRINGFIELD PHOTOGRAPHER'S
GOOD NAME.

A BRACE of swindlers have "worked" the good people of Hampden County out of hundreds of dollars by using the name of the well-known photographer, Chauncey L. Moore, of this city.

About two weeks ago a glib-tongued stranger came to town and applied to Mr. Moore for a position. Mr. Moore engaged the man to canvas the towns for him. He had 100 cards printed, called "special discount cards." Any person could procure one of the cards by paying fifty cents down. The cards entitled the purchaser to one dozen cabinet photographs at C. L. Moore's for \$3.50, a considerable reduction from the usual price.

The man gave his name as J. G. Morse, of Boston. He was to start out last Thursday, but failed to do so. Mr. Moore's suspicions of the fellow were excited the following Friday. The stranger told too many lies to suit Mr. Moore, who is a decided enemy of dishonorable business men, so Mr. Moore took back the tickets and discharged the man.

Then the wily stranger went to the printing office of F. K. Williams & Co., where the cards were printed, and ordered several hundred cards in Mr. Moore's name. He secured the cards unknown to Mr. Moore and started out to "work" the towns.

Last Monday Mr. Moore heard from the stranger in this city; then in Brightwood, Chicopee and Chicopee Falls. A Brightwood

man was offered a \$20 photograph for \$6, and others were offered marvelous bargains.

The pseudo agent got whatever he could on the cards, from fifty cents to \$2, and in all he must have cleared several hundred dollars.

He was tracked to Palmer, and the officers were told to watch for him. They found that two sharpers instead of one were working the town. One man, who gave his name as A. H. White, was arrested and taken to this city. Morse was arrested in Willimantic, Conn.

White claims that he was working for Morse and did not know that Morse was a fraud, so he was released from custody this morning.

Mr. Moore is determined to push the case against Morse to the full extent of the law.—*Springfield, Mass., Paper.*

MESSRS. MILLER & HOPKINS, of Brooklyn, send us a neat little hand-book and catalogue of photographic apparatus that contains many novelties for amateurs.

WE are indebted to MESSRS. MCGHIE & BOLTON, of Glasgow, for a handsome calendar on a cabinet mount embossed in gold. It adorns our office, being both useful as well as ornamental.

DR. E. L. WILSON sends us two handsome volumes of the "Philadelphia Photographer" for 1888, being volume 25 of the series. We tender the doctor our best thanks for this handsome addition to our library.

A. S. ALOE & Co., of St. Louis, send a handsome catalogue of apparatus and supplies for photographers. Judging from the number of illustrations of the apparatus of our publishers, their manufactures must be favorites in the West.

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PHOTOGRAVURE

NEGATIVE BY JULIO POU

St. Domingo Family.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

FEBRUARY 23, 1889.

Vol. XX.—No. 4.

COLUMBIA COLLEGE EXHIBITION.

THE Fourth Annual Exhibition of the Columbia College Amateur Photographic Society took place in the Chemical Museum of the School of Mines, February 14th and 15th. Over four hundred and fifty pictures were exhibited, and these showed steady progress in the art among the members of the society. In such a goodly collection of photographic prints, by men who work at the art in the hours they have to spare from their studies, it is not well to be severe in criticism. Yet when the world is called in to view the handiwork of these votaries of our art, it is best to judge impartially, to criticise honestly, in order that still further progress shall be attained in the future. With this idea in our minds we rambled through the alcoves of the museum and noted the work of the members of this young and progressive society.

The first exhibit that attracted our attention was a number of $6\frac{1}{2} \times 8\frac{1}{2}$ prints, by W. S. & A. W. Post, of characters in costumes for a fancy ball. In these the difference between plain and orthochromatic plates for taking colors was very well illustrated; the latter plates giving much more detail and generally more harmonious pictures.

The same exhibitors also had an excellent set of dog pictures, instantaneous views of individual dogs and groups of the animals on $4\frac{1}{2} \times 6\frac{1}{2}$ plates, taken at the Somerset Kennels. In the same exhibit were also found a number of Adirondack views, on 8×10 plates, in which the foliage was particularly well caught. In one of these views we have a couple of canoeists crossing a stream on a log bridge, one carrying the canoe. The print is marked "taken while raining," and is remarkably good, showing the perfection of modern dry plates and the skill of the Post Brothers in getting so much detail out of a negative taken under such adverse circumstances.

Among other pictures by the same exhibitors we noted a very pretty view of an old overshot water-wheel, a bit of the picturesque that would charm an artist. Also a number of excellent instantaneous views of athletes, jumping, running, etc. One of these latter gives a picture of a jumper just turning a bar, with his feet almost touching the rail. Altogether this exhibit shows an uncommonly good knowledge of photographic processes, and is one of the best, possibly the best, in the exhibition.

The next exhibit we noted was from the dark room of Mr. Ralph McNeil, who has already given evidence of his uncommon skill in photographic work at the exhibitions of the Society of Amateur Photographers of New York. He had a handsome frame of views and street scenes on $6\frac{1}{2} \times 8\frac{1}{2}$ plates, and among them was a very fine interior. To say that his work was very good is but poorly to repay him for his skill, good taste, and the steady progress he has made over his former work; his exhibit is excellent, and we wish there had been more of it.

Cheston Simmons had an exhibit that contained some excellent pictures. A portrait of a lady on an 8×10 plate was excellent. It would make some of our professional photographers feel badly to think an amateur could do such good work. A group with foliage background was also very good. A picture of some dogs was also very well done. A kind of *tête-à-tête* at a window, between a lady and gentleman leaning on the sill and with the stile of the window separating them, was a unique idea, and the picture was an excellent photograph. Another novel idea in this exhibit was a number of ladies' faces peeping through foliage, also very well done.

Dr. L. H. Laudy, of the School of Mines, made an exhibit of some of his beautiful photomicrographs. His skill as a photographer is too well known to need any comment from us; but recently he has entered, for him, a new field of photographic research, that of photomicrography. In this, as in every other department of our art which he has entered, he has met with his usual success. The results shown at the Columbia College Exhibition are simply wonderful. With a photographic skill the result of years of practice, and with instruments perfectly fitted to the subjects to which they were applied, Dr. Laudy shows work that has in many cases never before been attempted, and certainly never excelled. To mention only a few of the subjects that have fallen into his hands and been made to exhibit their structure upon the photographic plate through the microscope, we noted the wonderful saw of the saw-fly, enlarged forty diameters; the foot of a spider, seventy-five diameters; the foot of a house-fly, made on both plain and orthochromatic plates, the latter giving some exquisite detail; and the same object showing pulvilli, an uncommonly beautiful result. Also a number of others that our space will not allow us to notice. They must be seen to be fully appreciated.

Henry R. Taylor exhibited a number of excellent views of Niagara Falls, surf and other views at Newport; also some good interiors. The surf pictures were particularly good, indeed we have never seen anything better upon the subject. The old "Bishop Berkeley's House" at Newport, also the "Old Mill" at same place, were excellent views of photography as well as interesting pictures.

Oswald Jackson exhibited a frame of interiors, some of which were taken by gas-light, and the results were unusually good for that kind of illumination. He also had a couple of blue prints which showed the effect of treating with ammonia water, making them paler and in some respects improving them.

Lincoln Cromwell had a number of excellent instantaneous shots of ball and tennis games. Also some fine views from various points upon the decks of the United States Steamship Atlantic. In the same exhibit we noted a number of very pretty views in Ulster county, N. Y., that were picturesque and uncommonly good photographs.

J. H. Wainwright, the Secretary of the New York Camera Club, showed a number of excellent 8×10 views, every one of which was a picture. They all ex-

hibited unusual artistic taste and some very skillful work in photography. We cannot particularize; they were all very good.

C. W. & A. A. Stoughton, two of the most energetic and enthusiastic members of the Columbia Society, exhibited a number of pictures that were fully up to their work of former years. Some particularly difficult pieces were views of avenues of trees in deep shadow, yet the pictures were full of the softest detail and uncommonly pleasing to the eye. Some portraits and groups of little girls were also very good. Also an interior of chapel with Easter lilies in chancel was very fine.

There were a number of other exhibits, but our space compels us to defer notice of them until the next issue of the BULLETIN.

EDITORIAL NOTES.

THE Society of Amateur Photographers of New York had a jubilee meeting on January 31st, in commemoration of the fiftieth anniversary of the discoveries of Daguerre and Fox-Talbot. The occasion was a very interesting one from the fact that some of the oldest photographers in New York gave reminiscences of the time when the early discoveries of photography startled the New World. Dr. Laudy, of the School of Mines, exhibited the old daguerreotype apparatus from the museum of Columbia College, which proved highly interesting to the modern dry plate workers.

THE Oldham (England) Photographic Society recently celebrated its twenty-first anniversary by a dinner at the Freemasons' Hall. Each member present received a unique card, which may be described as follows: "The background is formed of the covers of twelve of the principal photographic journals and almanacs. In the center is a photograph in miniature of members of the present council, below which is the coat of arms of the borough of Oldham, and the society's presentation print for 1888. In the top left-hand corner is a photograph of the first meeting place of the society. On the same side, at the bottom, is a list of the first council, formed in 1867. In the top right-hand corner is a photograph of the Lyceum, the present meeting place. In the corresponding corner below is a list of the present council for the year 1888. The whole is surmounted by a photograph of the President (Mr. Greaves).

WE are indebted to the worthy Secretary for a copy of this card, and note that the BULLETIN is counted among the twelve most prominent photographic journals of the world; a very good reproduction of its cover appearing on this little memento of the Oldham Society's Dinner.

THE Photographic Society of Chicago will hold an exhibition in that city some time in May next. Medals and diplomas will be awarded, and the competition is open to both professionals and amateurs. Circulars of information can be obtained from C. Gentilé, 96 State street, Chicago.

WE are indebted to our good friend, Mr. Fred. E. Ives, for a copy of his handsome monograph on "A New Principle in Heliochromy." It is beautifully printed on fine paper, and is a valuable addition to our library. At an early date we hope to give our readers some idea of its contents, which discuss some of the author's methods for producing photographs in colors.

At the recent meeting of the Photographic Section of the American Institute, Dr. Milton J. Roberts exhibited his method of taking photographs in medical and surgical cases by means of electricity and the magnesium flash. In this way it is possible to move the shutter of the camera and fire the flash at the same instant. As a means of marking the progress of disease in hospital wards, or even in private houses, photography is becoming more and more useful every day.

WE are indebted to Mr. J. E. Davison, of the Providence Camera Club, for cards of invitation to the lantern exhibition given at Blackstone Hall. The subject of the evening was "Narragansett Bay as seen by the Club," and we are satisfied that the occasion was a very enjoyable one. We regret that time and space prevented us from participating.

THE New York Camera Club held a special meeting for the election of new members and other business, on Friday, February 15th last. The meeting was the first in their new club rooms at 314 Fifth avenue, where they hope to soon be in good working order.

"AN Illustrated Description of Boston"—a lantern exhibition of the work of the members of the Boston Camera Club—was given at Chickering Hall, Tremont street, Boston, on February 13th last. After the slides have been to Chicago and San Francisco, they can be had by other societies by applying to Mr. Edward F. Wilder, the Secretary of the Boston Camera Club, 50 Bromfield street, Boston, Mass.

THE first annual exhibition of the Springfield Camera Club took place January 24th, 25th and 26th, at Jensen's, on Main street, Springfield, Mass. Among the prominent pictures we note Mr. Hinsdale Smith's "Old Powder Mill," which took the prize for landscapes; also "On the Westfield at Huntington," by the same member. Another pretty landscape was W. P. Draper's "In the Maine Woods." "Market Street Fire," by Henry N. Bowman, was also a good picture. The "Three O'clock Express," by C. W. Shaw, was another good instantaneous shot, and very well caught. The following is the list of prize winners: Landscape, Hinsdale Smith, Jr.; marine view, Lewis J. Powers, Jr.; architecture, H. N. Bowman; interior view, Charles W. Shaw; animals, F. P. Bigelow; instantaneous, F. P. Bigelow; portrait, W. P. Draper; group, Ames Carter, of Chicopee Falls; composition picture, same; detective camera views, Ellis A. Hallett; bromide enlargement, H. N. Bowman; transparency, W. P. Draper; general exhibit silver medal to F. P. Bigelow.

WE regret to hear that the fire which destroyed the laboratory of the Ohio State University also burned a large amount of the valuable photographic apparatus of Professor N. W. Lord and Mr. H. J. Ditmers, which was in the building, together with much valuable material in the shape of negatives, prints and lantern slides. The money value of these amounted to nearly \$1,000; but this very poorly represents the time and trouble spent upon their collection, and many of them probably cannot be replaced. Professor Lord and Mr. Ditmers have our sincere sympathy in their great loss.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Photographic Re-Inventions.—Metabisulphite of Potassium.—Chloride of Silver Gelatine Paper; How to Use and Tone It.—Anthony's Bromide of Silver Paper for Enlargements.—How to Make Limoges Enamels by Photography.

IN the issue of the *Photographic News* of January 11th, I have read a highly interesting article about progress in photography in 1888, by Mr. C. H. Bothamley. He says: "Any one at all acquainted with the contents of photographic journals will readily call to mind many instances of the re-invention of a re-invention; the old device being brought out each time as if it were absolutely new. For example, the method of determining the speed of a shutter by means of a tuning fork was published by Abney in 1882; and since that time the method has been re-invented several times."

Mr. Bothamley gives several other instances of re-inventions and among them the following :

Recently Ives has described a process of heliochromy (*Journal of the Photographic Society of Great Britain*, XII., p. 154, and *Photographic News*, 1888, pp. 789-802), of which he says: "I claimed for this process that, unlike any similar process yet suggested, it was based upon a true conception of the nature of light and color vision, and was a strictly scientific method of accomplishing the object sought after." Mr. Bothamley continues: "Now, as a matter of fact, a strictly scientific process of the same character was described by Vogel in 1885 (eighty-five) *Annalen der Physik*, N. S. XXVII., p. 130; *Philadelphia Photographer*, 1887, p. 681.

It has come to my notice too often, that observations made by me have been published by others some years later as their own inventions, to be surprised about the foregoing case, but I am glad to see that my rights of priority are defended by others.

During the last three months potassium metabisulphite has frequently been recommended and put into the market in place of sulphite of potassium. For what reason I will leave undecided.

My son has made some experiments with this. He doubts that the pyrosulphite of soda will preserve ready-mixed hydroquinone or pyro developer better than a correspondingly large quantity of sulphite of soda; pyrosulphite of potassium decomposes in an aqueous solution to sulphite of potassium and sulphurous acids, but the latter unites at once with the alkaline salt of the developer to sulphite of potassium, and carbonic acid escapes. For this reason the addition of caustic potassium acted favorably, by replacing the alkaline salt changed into sulphite of potassium. A subsequent addition of carbonate of potassium or soda would likewise reduce the retarding influence of the pyro sulphite of potassium. In addition to this, he remarks that it is not good to accelerate the development too much by too strong alkaline solutions; and with the hydroquinone developer and too rapid development it was the same as in the albumen process with the accelerated toning by an excessive addition of gold solution, slower work gives in both cases much more certain and better results. The fresh hydroquinone developer acts on many plates in a fresh condition much too strongly, and to obtain good results the new developer should be always mixed with some old, or in cases of over-exposure old developer

only should be applied. To obtain hard negatives (reproductions of line engravings) it is best to apply a developer which has been pretty well in use, and can be strengthened by addition of a few drops of concentrated hydroquinone solution (alcoholic).

In my last letter I wrote to you about the quick copying process with chloride of silver gelatine paper. The same has already found, in several instances, a successful practical application. Herr Halwas obtained in the beginning of last December an order for forty-six copies of his photographic reproduction from the painting of the battle of St. Privat, intended to serve for the ornamentation of some invitation cards to a banquet, to be given by General von Pape, on the following day. The forty-six pictures were at once copied in succession at an exposure of fourteen seconds, developed at night, and were ready for delivery on the following forenoon. In the "Verein zur Förderung der Photographie" he made known that the pictures show an agreeable black tone without toning, and that they have to be developed rather deeply, because they will weaken somewhat during fixing.

Herr Baltin, in return, remarks that the pictures may be developed in a clear red light, which is confirmed by Mr. E. Vogel, who develops even in yellow light.

According to the latter, the toning of the chloride of silver gelatine prints can even take place in diffused daylight. With the toning of these prints it is of course always a peculiar thing. Absolutely even tones are very difficult to obtain.

My son copied a medium dense negative upon chloride of silver gelatine paper in an ordinary printing frame in the interior part of a room, 4 meters distance from the window, 8 seconds' time, in good weather, and 45 seconds in dark weather, and developed the same with the following developer, prescribed by Dr. Just for "albumen tones :"

I. Water.....	1,500	c.c.
Oxalate of potassium.....	90	grams.
II. Sulphate of iron	25	"
Citric acid.....	2	"
Bromide of potassium	0.2	"
Water.....	500	c.c.

Developer I. and II. mixed to equal parts.

The development proceeded until the picture was a little darker than intended to be when finished ; it was then thoroughly washed, as mentioned in the prescription, with diluted acetic acid and water and toned with the borax gold bath, as generally used for albumen prints.*

The tone of the pictures changes greatly in the fixing bath after toning, but improves while drying ; the longer the picture remains in the gold bath, so much more blue it will become afterwards. The time of exposure has a great influence upon the tone. It is therefore very difficult to obtain a large quantity of uniform tone. These two points form the main difficulty of the process, and it requires some practice before the correct tone can be acquired.

* The following Obernetter sulphocyanide gold bath, applied before or after fixing, gives also good results :

I. Ammonium sulphocyanide	20	grams.
Hyposulphite of soda.....	1	"
Water.....	1,000	c.c.
II. Chloride of gold.....	1	gram.
Water.....	100	c.c.m.

100 c.c. I. are mixed with 5-8 c.c. II.

At the same meeting of the before-mentioned society, Messrs. Beyrich, of this city, showed some very handsome enlargements upon bromide of silver gelatine paper from the well-known firm of E. & H. T. Anthony & Co., of New York, which, on account of the delicacy of the half-tones, fineness of delineation and depth of tone, met with general admiration. (*Photographic Mittheilungen*, January issue 1, 1889, p. 250.)

An original process, to imitate photographically the celebrated enamels of Limoges, has lately been patented. It is, so to speak, nothing but a carbon print process, only in reversed manner. Instead of copying under a negative, one copies under a positive; instead of black carbon paper, upon white; instead of white transfer paper, upon black. The inventor, Schirm, gives the following details:

Twenty parts gelatine, 50 parts zinc with solid color water or 100 parts zinc white paste, 9 parts sugar, 30 drops of glycerine and part of 1.8 bichromate of potassium. Rosin or collodion, made sensitive in equal manner, may also be applied.

The application of these materials for photographic purposes is well known, and is used in a good many ways; but in all processes of this kind, as the carbon process, Litchdruck, Asphaltum process, etc., they are applied in an essentially different composition, and the reproduction of the original takes place in dark tones or lines upon light ground, where the shadows are produced by a more or less great transparency of a dark mass laid on, and the high lights on the contrary are formed by the remaining light ground. The enamels of Limoges, in opposition to all other kinds of artistic representations and enamels, have the peculiarity, that the lights are produced and executed by the laying on of a lighter coloring matter upon a dark ground, while the shadows are produced by the transparent or uncovered ground. It is exclusively this peculiarity of the enamels of Limoges which gives them the highly decorative and artistic value which they possess.

The gelatine solution composed after the before-mentioned proportions respectively, mixed with a light powdered color, and made sensitive to light, is spread in the dark upon a temporary layer of paper, muslin or any other suitable material. After drying has taken place in the dark, the film is exposed to light under a transparency, but not as in the pigment or any similar process, by using a negative of the object to be made. While with the latter—particularly in the pigment process—the use of a photometer is absolutely necessary to determine the degree of exposure, this is not required in the process in question, the impression of the light upon the sensitive film being distinctly visible, and therefore exactly controllable.

The temporary support—paper, muslin, etc.—is, after a short soaking in cold water, now pressed with the picture side upon the darker colored object to be ornamented, and treated with warm water until after removal of the support by dissolving of the unexposed parts and more or less strong appearance of the ground, the picture or ornamentation will form. In the process with asphaltum or other light sensitive resins, the development takes place by the relatively suitable means of solution. The developed picture is thereupon dried and is coated with a durable varnish.

BERLIN, January, 1889.

THE LIGHTING IN PHOTOGRAPHIC STUDIOS.

BY P. C. DUCHOCHOIS.

(Continued.)

XI.

Nor thinking I should give instruction for the development of gelatine plates, which are now exclusively employed to take portraits, I said in one of my previous papers that the photographer should not confine himself to the study of the art of posing and lighting, but should also study thoroughly the photo-chemical processes by which the pictures are obtained. I saw, since, that it was a necessary complement to "the lighting in the photographic studios," and this because I have ascertained that there were as many pictures spoiled by a bad management of this process as by an entirely deficient lighting.

In going around lately to see the works now made in New York, I was astonished to see poor portraits, side by side, exhibited in show-cases with excellent ones. I carefully examined these pictures, trying to account for the disparity, and I came to the conclusion that most likely every one was developed with a standard developer compounded to suit the average time of exposure without taking any notice whatever of the manner the model was lighted. To satisfy myself that my criticism was right, I stepped in to some of the studios in question, and in conversing with the operators I found that, as I thought, every picture was developed after the day's work with a compound devised once for all, since, as I was told, the exposure is, so to speak, always the same, one or two seconds less, one or two seconds more, according to the intensity of the light.

Of course there are many photographers who know well how to develop, but there are a great many more who do it mechanically, not having experimentally studied the behaviors of the chemicals employed. We will try to demonstrate them in this paper and to show what should be the treatment of the plate to suit special lightings.

The ferrous oxalate developer is now discarded by almost every professional and amateur photographer. We will, consequently, confine ourselves to the development with pyrogallol, which consists of mixing this reagent with an alkali: ammonia, sodium carbonate, or potassium carbonate.

Let the experimenter place a gelatine plate—which we suppose to have been well exposed—in a dilute solution of one of these alkalies; nothing appears; but if a small quantity of pyrogallol be added, the image comes out in a certain period, and if the entire development be carried through without adding more pyrogallol, a negative image is obtained full of details in the lights and shadows, but without sufficient contrasts to produce a brilliant impression. The positive image will be flat, and insipid.

Now, let the opposite experiment be made; that is to say, develop a picture taken from the same subject, with the same lighting and exposure, using less alkali and a full dose of pyrogallol; the high lights acquire, then, great intensity, but the half darks—or details in the shadows—hang back and the half lights become buried in the high lights. Result: a picture without gradation, white and black. How true is this remark, made by Captain Abney: "Development of gelatine plates is in reality an art and a science combined; the art consists in getting gradation, the science in mixing your solution to obtain it."

By these two experiments we understand the action of the alkalies and that of pyrogallol, and from them we can conclude *a priori* that the latent image of a model lighted by a soft, subdued light cannot be treated like one brilliantly lighted with opposition of light and dark—à la Rembrandt, for example—which is the extreme of this manner of lighting—however both plates having received a proper exposure.*

When the model is lighted to produce the latter style of pictures the lights have necessarily a great tendency to flash out under the action of the developer, while the half darks require an energetic treatment to be brought out in time. If, then, the plate be acted on by a normal developer—which generally consists of three grains of pyrogallol and twelve grains of potassium carbonate dissolved in an ounce of water—the high lights appear rapidly and require intensity before the half darks are fully developed. The resulting picture is, therefore, deficient in gradation. But if instead of proceeding thus we compound the developer with, say, half the quantity of pyrogallol, the lights will now remain comparatively weak during the first period of the development, and as soon as the half darks are well developed in density, the contrasts are easily obtained by the addition of more pyrogallol.

In the opposite case, that is to say, when the model is lighted by a diffuse light, a good picture may be obtained with the normal developer, provided the contrasts be sufficient in the lighting; but this is not generally the case and effect should be produced by the development. Therefore the plate should be treated by a solution containing, say, half the quantity of alkali and a good dose of pyrogallol, and when the lights are well out and of a certain intensity the half darks are acted on by adding the remainder to force them out.

It is not necessary to multiply these examples. From the preceding ones, everybody will see at once that the development of the portrait of a child or of a lady with a very fair complexion cannot be made as that of persons having a colored or sun-burnt face; the former entering in the general treatment of the first example, and the latter in that of the second.

As to definite formulas, none can be given. The reason is obvious. Moreover, the difficulties to overcome are not so great as they appear. By well conducted experiments and a little practice one will soon learn how to develop a picture according to the lighting, the complexion and dresses of the models. The general rule is that the lights should not gain intensity before the half darks are quite visible.

In the above examples it is supposed that the plates have been well exposed.

The development according to the exposure, which should necessarily be taken into account, is exactly similar: When a plate is over-exposed the lights and half darks have nearly the same tendency to flash out, hence a developer weak in alkali, strong in pyrogallol, should be employed. On the other hand, if the plate be under-exposed—and by under-exposure we mean the minimum, for a plate which has been in reality under-exposed, never yields anything but a bad, white and black picture—then the half darks hang back, while the lights intensify rapidly under the action of the normal developer. Therefore, the plate should be treated as one from a model lighted with strong contrasts. In fact, under-exposure corresponds to such an exaggerated lighting.

* It has been recommended to place the model in a strong illumination and to light it with much contrasts, exposing then for the shadows. We do not advise this method, for the lights are, as a rule, solarized, *i. e.*, devoid of gradation.

To resume :

Pyrogallol being the real reducing agent produces vigor and intensity.

The alkalies exalt the reductive property of pyrogallol and tend to diminish the contrasts.

As a consequence: the image develops slowly but with great vigor, when to the pyrogallol a corresponding small percentage of alkali is added; and, on the contrary, it appears rapidly in all its details, the high lights remaining comparatively weak, when the alkali is employed in great proportions. By excess the alkalies produce fogginess.

Besides the chemicals, sodium-sulphite and potassium-bromide are employed with the alkaline pyrogallol. The former, a deoxidizing agent, prevents pyrogallol tinging the film yellow by its rapid oxidation in presence of an alkali; the latter checks the development without stopping it. It acts, therefore, as a regulator. Its use is valuable both in cases of over and under-exposure. In the former case it tends to give clear shadows and vigor, in the latter it allows the plate to be submitted to a long development in order to bring out the details without danger of fogging the picture. Its chemical action is not well understood; its effect is to prevent the reduction of the silver bromide not acted on by light.

We have purposely given general directions without entering into the details of the developing process; moreover, it pertains but incidentally to the subject we have treated. For more complete instructions the reader is referred to special treatises.

XII.

In this last paper we merely wish to call the attention of photographers to a certain process to improve the negatives, for, no matter how well lighted is the model, the artistic effect is not rendered as it should be, owing to the insensitiveness of the ordinary chemical preparations to the less refrangible rays of light.

While speaking of the head and other screens we advised to have them made of a colored material. This has for its object not only to diffuse and regulate the light, but also to reflect on the model a feeble non-actinic color in order to obtain better gradation in the parts the most strongly illuminated, and to lessen the contrasts thereby. But this method, although much improving the lighting, is not sufficient to obtain perfect negatives, needing little retouching; moreover, for certain complexions, certain subjects, such screens are objectionable and should be replaced by others in light-blue or violet materials.

Every photographer knows too well that each ray of light impresses differently the photographic film, and that the colors are, in consequence, not reproduced with their luminous value, thus modifying the gradation from light to dark by forming half darks or darks where there should be lights or half lights, besides exaggerating the imperfections of the skin and even rendering visible spots not perceptible to the eye, necessitating therefore much retouching, which, however skillfully done, alters and spoils the resemblance. Indeed, it is a great *desideratum* to obtain negatives which require but little working up in order to preserve the texture of the skin and the delicate *modelé* of the human face, instead of giving to the living flesh that appearance of marble we see in nearly all the retouched portraits.

This can only be obtained by the process discovered by Dr. H. W. Vogel.

To our knowledge this remarkable process—by which the most serious shortcoming of photography has been overcome—is not employed for portraiture. Why? It is difficult to say; and can only be explained by the routine to which every one of us is inclined in his occupation. However, the best results in this and the other branches of our art can be obtained solely by the ortho-chromatic process: it is the process of the future. Not by using for portraits plates so much stained, by a good deal, as those employed for the reproduction of oil-paintings for landscapes, etc., but prepared by diluting the baths usually made for the latter purposes.

We recommend an azaline and erythrosine mixture similar to that the late B. Obernetter employed for objects not containing much red, which Dr. Vogel describes in one of his interesting letters to the BULLETIN (Vol. XVII., p. 300).

The few experiments we have made in this direction are promising and leave no doubt in our mind as to the efficacy of the method. No yellow screen is needed, consequently the time of exposure is nearly the same as that required for the ordinary gelatine plates.

THE LAW AND PHOTOGRAPHY.

BY MR. MORRIS COOPER.

(Continued.)

(Read before the Photographic Section of the American Institute.)

It is appropriate here to speak of

THE CONTRACT TO PHOTOGRAPH.

What does the photographer undertake to do when he engages to supply photographs? Does he contract to furnish artistic, pleasing, beautiful pictures, or accurate and faithful likenesses? I would not for a moment be understood as saying that the idea of the one excludes the other. But the point is, what does the customer expect, and what is he entitled to receive? It seems to me that the customer has a right to expect a good likeness, finished in as artistic a manner as the contract calls for. But this opens the door to a sea of controversy. What is a good likeness? Perhaps the sitter belongs to that unfortunate class in the community who cannot show you the family album without remarking that "they really never take a good picture, but that So-and-so always does." And then there are one's friends, cousins and aunts, whose opinion is of vital importance on the subject. A certain Mrs. Pearson, of London, was sued for the price of some photographs she had ordered. The photographer admitted that the negative had been touched up, but alleged that it was necessary in order to make customers look their best. The judge thought the photographs made the lady look younger than she appeared to be; but she, strange to say, protested against a flattering likeness. She wanted it perfectly natural. The case was submitted to the jury, and they, probably unable to comprehend so unusual a defence, brought in a verdict against her. Whether a painting or photograph is executed in the most artistic manner possible, only an artist or photographer can tell; but ordinary witnesses, the courts have held, are competent to say whether a photograph is a good likeness. In short, whether a photograph is a good likeness or not, will have to depend upon the particular jury before whom the picture is exhibited. As to the price of pictures, it has been held that if no special contract is made fixing his compensation, the artist is entitled to such pay as, taking all the circumstances together, his work is reasonably worth. The market price of such work would have to be determined from the evidence of photographers doing the same class of work. But a very important circumstance to be considered on such an inquiry, is, not only the real standing of such artist, but also his apparent worth as shown by his appearance, surroundings and general bearing. A case illustrative of this point recently arose in Michigan. The plaintiff

was an artist, and from photographs, painted pictures of defendant's children. No agreement seems to have been made fixing the price for the work. The plaintiff demanded that the court should recognize as an element of his charges, the expense and preparation necessary to make a first-class artist, but the court did not see things just that way. It decided that if a man has really become eminent in his profession, and has a recognized standing, his compensation may by a customer be fairly presumed to be in the line of what eminent artists charge, but an obscure and unknown artist, getting a job for perhaps the first time, cannot demand from the customer so great a fee, for the reason that the customer has a right to expect that the charges will be in keeping with the artist's surroundings and general appearance. I confess that I am not in sympathy with this decision. I believe that it holds up a wrong standard. It seems to me that the principle which deems every laborer worthy of his hire is as applicable to art as to any other kind of work. A man should be paid for what he can and does do, and not for what he seems to be able to do. For improper and immoral pictures no compensation could be recovered. And this brings me to consider

IMMORAL AND OBSCENE PHOTOGRAPHS.

The manufacture and circulation of these is not only culpable legally, but is equally odious and detestable from the standpoint of true art. It is sometimes said that, in reference to this subject, the law is too straight-laced and prudish, but that this is not so, and that sound and sensible views are entertained by the judges before whom such matters have come for consideration, I shall endeavor to show by reference to a case recently decided in our own Court of Appeals. A man, whose name need not be mentioned, was convicted under our Penal Code for selling obscene and indecent photographs. It appeared that the photographs represented nude females, and were photographic paintings which had been exhibited in the Salon in Paris and one of them at the Centennial Exhibition in Philadelphia. It was decided that it was immaterial whether the pictures had been exhibited in these galleries or not. Now follow carefully the reasoning of the court. Judge Andrews, an exceedingly clear headed judge, said : "It is to be observed that the statute does not undertake to define obscene or indecent pictures or publications. But the words in the statute are themselves descriptive. They are words in common use, and every person of ordinary intelligence understands their meaning, and readily and in most cases accurately applies them to any object or thing brought to his attention which involves a judgment as to the quality indicated. It does not require an expert in art or literature to determine whether a picture is obscene or whether printed words are offensive to decency and good morals. These are matters which fall within the range of ordinary intelligence, and a jury does not require to be informed by an expert before pronouncing upon them. It is evident that mere nudity in painting or sculpture is not obscenity. Some of the greatest works in painting and sculpture, as all know, represent nude human forms. It is a false delicacy and mere prudery which would condemn and banish from sight all such objects as obscene, simply on account of their nudity. If the test of obscenity or indecency in a picture or statue is its capability of suggesting impure thoughts, then, indeed, all such representations might be considered as indecent or obscene. * * * * *

The test of an obscene book was stated in *Reg. V. Hicklin* L. R. 3 Q. B. 369, to be, whether the tendency of the matter charged as obscenity is to deprave or corrupt those whose minds are open to such immoral influences, and who might come in contact with it. We think it would also be a proper test of obscenity in a painting or statue whether the motive of the painting or statue, so to speak, as indicated by it, is pure or impure ; whether it is naturally calculated to excite in a spectator impure imagination, and whether the other incidents and qualities, however attractive, were merely accessory to this as the primary or main purposes of the representation." I think the language of the court in this case is in harmony with the views of the majority of cultivated people on the subject.

PHOTOGRAPHS AS EVIDENCE IN COURTS OF JUSTICE.

The photograph is beginning to play an important role in judicial proceedings. It is a species of what is called secondary evidence. That is to say, it is to be resorted to in explanation and support of other evidence, or when no other evidence is available. It has been introduced in both civil and criminal trials. I shall cite a few typical cases. In the Buddensieck case, which, as you remember, was a prosecution for manslaughter caused by the falling of a building negligently constructed, a photograph of the premises showing the defective construction was used and exerted great influence in securing a conviction. In the celebrated Ruloff murder trial, an important link in the chain of evidence against the accused was forged by means of photographs which identified his confederates. On the trial of the Shepherd's Fold case, which was a prosecution for starving and ill treating a boy who was an inmate of the "Fold," photographs of the boy, showing the effect of the "Shepherd's" shepherding, landed the shepherd in the penitentiary.

An Iowa case presents some curious features. It was an action for damages for assault and battery. On the trial, which took place nearly two years after the assault, the defendant exhibited to the jury the plaintiff's back and shoulders, which, of course, after that lapse of time since the injury, could not exhibit any very great marks thereof. But the plaintiff, not to be outdone, then triumphantly exhibited photographs of the same back and shoulders taken three days after the assault. This must have been a case of diamond cut diamond. The plaintiff, however, was the sharper diamond, and was victorious in the suit. There is also the case of a Canadian lady whose husband was lynched in Alabama by a mob. He had sent her a photograph of himself, taken shortly after his arrival in that State. She brought a suit against the county where the little "accident" occurred for damages for the loss of her husband's life, and her whole case, which I am glad to say she won, depended upon the photograph, for her husband had been a stranger in the community, and by means of the likeness he was identified. In suits growing out of defects in highways, railroad accidents, forgery of commercial paper, disputed signatures, photographs have become valuable aids. But it must not be supposed that every photograph is received with open arms in a court of justice. The liability of photographers to err, to present partial, inaccurate, distorted, and even downright dishonest views, is well known to the courts and has often been commented on. In the Tichborne case, a photographer represented a place as a *grotto*, which in reality was nothing else than a path about a hundred feet long, shadowed by trees, having a public way on one side and a public towing path upon the other. The Lord Chief Justice (Cockburn) presiding at the trial handled it without gloves. He said: "I must add that it reflects the greatest discredit on the man who concocted that photograph." That is not with any disparagement to the art itself, for in the same case the art of photography rendered most valuable help. "The principal documents in the case," says the *London Times*, "the pocket-book of the defendant, his letters and those of Roger Tichborne, were photographed by the Stereoscopic Company, under the auspices of Mr. Nottage, their manager, and the *fac-similes* thus produced were of immense value in facilitating the comparison of handwriting, to which the Lord Chief Justice attached much importance as one of the great tests of identity." A very valuable aid which the photograph is enabled to render in courts is to make copies of documents which, from their value, inaccessibility, or other peculiar features, cannot be produced in court. In several such cases the courts have directed the making of photographic copies.

It must be borne in mind, from the considerations to which we have before alluded, that photographs are very carefully scrutinized in courts of justice, and that the party desiring to use them must always be prepared fully to show all the circumstances under which they were taken, who the artist was, with what apparatus, in what light, from what point of view, at what distance, at what angle—in fact, must be prepared with all the details. He should also produce the negative, so

that that also can be subjected to rigid examination. Not until a photograph is "proved," as it is termed, is it competent to be admitted in evidence.

LEGAL USES OF PHOTOGRAPHY.

There have been numerous applications of photography to the purposes of justice. The rogue's gallery is familiar to you all. Not in any invidious sense, of course. Some suggestions which are of value, and some which are not, have from time to time been made respecting further applications of the art. One ingenious gentleman has invented an apparatus for recording deeds by photography. One has suggested that by photographing the impressions made upon the retina of the eyes of a murdered person, a possible clue might be obtained as to who the murderer was. Another proposition is to appoint a public photographer, whose duty it should be to take and preserve the likeness of all persons residing in England every five years, and also likenesses of all persons leaving the country. This is what, in politics, would be called a "fat" job. So it has been proposed that naturalized persons should have photographs of themselves attached to their papers, certified by an omniscient individual to be styled the "official photographer." Another idea is to photograph the witnesses deposing in trials, so that the pictures will be before the appellate court when it passes upon their testimony, and it could then see the witnesses both in tranquil and in excited moods. Still another proposition is to photograph riotous assemblies at various stages, and then subsequently prosecute the persons taking part. The difficulty, however, about this, is that there is a very decided danger that the photographer and his apparatus might, perhaps, perish in the riot long before he succeeded in getting a focus. The most practicable suggestion of this kind which I have met with is one to appoint a public photographer, who, in all cases of homicide, shall immediately repair to the scene of the crime and photograph it and the body. In this way very valuable evidence might be elicited. For the other suggestions and plans I do not think that legal machinery is as yet sufficiently advanced.

GETTING A CAMERA INTO CANADA AND GETTING IT OUT AGAIN.

BY J. B. BARLOW.

I HAD many misgivings about taking my camera into Canada in the first place. You see, my wife and myself intended making a trip to Alexandria Bay among the Thousand Islands, staying there for a week or ten days, when we would be joined by my brother and his wife and we would then proceed down the St. Lawrence as far as Quebec. Of course I would take my camera—and to take it direct to Alexandria Bay, N. Y., from Grand Rapids, Mich., would have been simple enough, as both places being in the United States the box would go through "in bond," and that would be the end of it; but, as luck would have it, I was born in Canada—in a pretty little village ten miles from Dundas (Dundas is a picturesque little town on the Grand Trunk Railway, near the western end of Lake Ontario), and as I had never seen my native town or village since I, but a youngster of ten, my parents, brother and two sisters had left it twenty-five years before—I was glad enough to make it part of our programme to pay a short visit and catch a few views of the scenes of my childhood. Well, I began inquiring among my friends and acquaintances, then among the railroad men, Collector of Customs, etc., until, finding the farther my inquiries reached the less reliable information I received, I wrote direct to the Collector of Customs at Windsor, stating my position. I received a reply at once which set all my fears at rest. I was to show his letter to the inspector on the train at Detroit and he did not doubt but that my camera could accompany me to

Hamilton, where, by again showing the letter to the custom officers in that city, I would be allowed to depart with it whither I pleased, etc.—simple enough—and so we started. That was the beginning—or you might say the preface, for the real beginning was when we reached Detroit. Our sleeper went through from Grand Rapids to Hamilton, and we reached Detroit about twelve o'clock at night. The car door opens. Canadian Inspector of Baggage: "What have you got? Anything dutiable?" I tell my story as hurriedly as possible, pull out my letter, which "his royalty" glances over, reads a line or two and says: "You'll have to go into the baggage car with me; just get ready while I go through the car and I will come for you." This is the commencement. I tumble into my clothes and am soon, in a semi-dressed condition, with camera in one hand and tripod in the other, following his royal "nibs" to the baggage car, where I soon discover nothing is to be done in my case, I being simply brought here to be under surveillance, as it were, until the cars are transferred across the river and reach Windsor, when the baggage-master must decide the fate of the camera. The "agony" is soon over. The Custom Inspector escorts me to the baggage room, the story is told, letter produced. The baggage-master I should imagine had eaten nails for supper and was in no mood to be trifled with by an amateur photographer. The camera should go forward next day as baggage. A check was given to me. "Where would I get it?" "At the Custom House." "When would I get it?" "Oh, I don't know, it will go forward tomorrow." Just then the inspector noticed the tripod. "What's that?" he asks. "Tripod," I reply. "Can you take pictures with it!" he grins. "Well, not to any great extent," I reply. "Very well, you can take it along with you." "Thanks, awfully," I rejoin, and catch onto the train as it moves off into Canada.

Seven-thirty o'clock A.M. the next morning finds us alighting from the train at Hamilton—it is a splendid morning—we ride up to the Royal Hotel in about the oldest, shakiest rattletrap of a hack we believe they could scare up, and the thought goes through my mind that when a youngster of four or five years of age, my father brought me down to this self-same City of Hamilton to see the "Prince of Wales." That was when he made his tour through this country about 1860, and we happened to get in the middle of a dense crowd of thousands of surging and shouting loyal subjects, through which the carriages of the Prince and his train were slowly forcing their way. The jam at length became so great that the procession came to a halt, when I found myself forced bodily up against the wheels of the carriage in which sat the royal personage. In the crush I had lost from my head a brand new hat bought for this express occasion, and I can still remember the laugh with which Prince Albert greeted my sudden yell of "Oh, pa, I've lost my new hat; I've lost my new hat." It was very evident I took much more interest just then in my "new hat" than I did in the (perhaps) future King of England; and now in 1888 I cannot help wondering if by any chance we should be riding to breakfast in that self-same carriage in which sat his royalty—twenty-five or thirty years of constant use would, I imagine, leave the carriage in just about the condition of this old specimen. By 8.30 we had finished our breakfast and soon found ourselves climbing three flights of stairs at the Custom House. At the top we find a grand looking old man (the janitor, by the way), to whom I rehearse my story. He ushers me out into a wide hall whose windows overlook a court with a low brick building on the opposite side. "There is where your

bundle will land, when it does land, probably by 10 o'clock. You must go in there" (here wheeling me around into another hall and pointing out a big door with "Customs Surveyor" painted thereon), and so we depart to stroll around the really fine little park called "The Gore," so named, no doubt, on account of its shape. Time 10 A.M. Enter my wife and myself with due reverence into the presence of The Inspector of Duties (where the camera is expected to land), and after sundry and more explanations, are told the camera won't come by express but by baggage; and then I remember the baggage-check given me at Windsor. I fish it out—No. 29,565—and we are directed to go to the Surveyor of Duties. This tallies with the directions given me by the grand old janitor, so around the corner we gracefully glide and again climb the three flights of stairs before mentioned, and present the check to the Surveyor, only to find that no report of camera has been received as yet—probably will be in at 3.50 P.M. We begin to get a little anxious, particularly as we know our Uncle, at whose home in Rockton we are to stay a few days, is waiting for us all this time back in Dundas, five miles away, where we wrote him to expect us about 9 A.M. Dundas, understand, is on the same line of road as Hamilton, and we came through the town in the morning; but not being a very large place, the fast morning train does not stop, so we intended taking a train back which would have landed us there as we say—about 9 A.M.

(To be continued.)

THE THIRD ANNUAL JOINT EXHIBITION.

THE joint exhibition of the societies of Philadelphia, Boston and New York, which is to be held in the Academy of Fine Arts, Philadelphia, from April 8th to 20th next, will be under the following regulations and rules:

The entire number of awards in the exhibition is left to the discretion of the judges, but shall not exceed twenty-five. Seven of these shall be for special excellence, one in each of the following classes:

Landscape or Marine Views.

Portraits.

Genre Subjects and Figure Compositions.

Enlargements.

Lantern Slides (set of six—negative and positive by exhibitor).

Applied Photography—Scientific or Technical.

Work by Ladies.

Awards may be made for an entire exhibit or for any part thereof.

All photographers are at liberty to compete, but the judges are instructed to give preference (other things being equal) to work done entirely by the exhibitor.

The members of the Board of Judges shall not compete for awards, nor be connected in any way with the management of the exhibition.

The decision of the Board of Judges shall be final.

Rules.

1. No picture which has once been exhibited in competition at a Joint Exhibition shall be again admitted for competition.

2. No picture will be received "for exhibition only," unless by special consent of the Committee of Arrangements.

3. No pictures which have taken prizes elsewhere shall be so designated, until after the awards have been announced.

4. All pictures, except those from foreign exhibitors, must be framed (with or without glass, at the option of the exhibitor). Pictures from foreign exhibitors should be sent by mail, unmounted. They will be mounted for exhibition by the Committee of Arrangements, free of charge, or will be framed if the proper amount to cover the cost is remitted with entry.

5. The Committee of Arrangements shall have the right to reject the whole or portions of any exhibit offered; and if in order to fairly apportion the space at their disposal among the various exhibitors it becomes desirable to leave any pictures unhung, the rejections shall be made at the option of the committee, either from exhibits below the average in quality or above the average in number of pictures or wall space required.

6. Entries of all exhibits must be made in duplicate, on blanks issued by the Committee of Arrangements, giving, for catalogue purposes, etc., information on the following points :

Number and size of frames.

Amount of wall space required.

Total number of pictures.

Subject or title of each.

Lens and plate used for negative.

If for sale.

Price.

Name, address, and society of exhibitor.

7. The exhibitor's name and address, also a number corresponding to the descriptive number upon the entry form, shall be clearly written on the labels provided, which shall be attached to the back of each frame.

When two or more prints are mounted in one frame, a designating letter shall be placed under the centre of each print, and all letters so placed shall appear in the entry form opposite the title of their respective pictures. Nothing else may appear in front of frame except title of picture and exhibitor's name.

8. No picture may be withdrawn before the close of the Exhibition.

9. All pictures must be sent at owner's risk, prepaid and delivered to the Committee of Arrangements at the place by them indicated, and return charges collected by carrier.

10. The committee will not be responsible for any loss or damage that may occur to exhibits while in its charge, but will use all reasonable care to prevent such occurrence; and at the close of the Exhibition will repack each exhibit and ship as directed by the exhibitor.

11. Advertising in any form in connection with an exhibit is strictly prohibited.

12. A charge shall be made for wall space at the rate of twenty-five cents per square foot (the minimum charge being one dollar) to all except members of the three societies and foreign exhibitors.

The amount of charge for wall space must be enclosed with entry form to the Committee of Arrangements.

If any of the pictures entered are not hung, a due proportion of the charges will be returned.

A commission of ten per cent. on all sales will be retained.

13. Arrangements shall be made for the proper exhibition of lantern slides on the screen.

14. The Committee of Arrangements, acting for the local society, shall receive all income and make all payments for expenses of the Exhibition, the said committee being required to turn over to the local society, within a reasonable time after the close of the Exhibition, properly authenticated vouchers for all expenditures, together with a statement of receipts, and the balance on hand, if any.

Entry forms and labels for back of frames will be furnished on application. Please state probable number of labels required. (See rules 4, 6, 7 and 12.)

All correspondence should be addressed to Robert S. Redfield, Secretary, 1601 Callowhill street, Philadelphia, Pa.

All pictures must be sent, charges prepaid, addressed to

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA,

Care of the Pennsylvania Academy of the Fine Arts,

BROAD AND CHERRY STREETS, PHILADELPHIA, PA., U. S. A.

And delivered before 9 P.M., Monday, March 25, 1889. The attention of foreign exhibitors is directed to Rule 4.

It is intended that the exhibition shall be open day and evening, Sunday excepted, and several evenings will be devoted to the display of lantern slides.

The names of the Judges and further details will be announced hereafter.

While ample space is at the disposal of the committee, it is desired to maintain a high average standard of excellence. Intending exhibitors are therefore requested to send a few *choice* examples of their work rather than a large number of specimens of only ordinary merit.

It is probable that at the close of the Exhibition, by request of the Boston Camera Club and at their expense, the entire collection of pictures will be forwarded to Boston, there to be publicly exhibited for a brief period, and thence returned to their owners. Any exhibitor not consenting to this arrangement will please give notice to the Committee of Arrangements upon entry form.

Committee of Arrangements.

JOHN G. BULLOCK, *Chairman,*

528 Arch Street, Philadelphia;

ROBERT S. REDFIELD,

SAMUEL M. FOX,

H. T. DUFFIELD, *Society of Amateur Photographers of New York.*

EDWARD F. WILDER, *Boston Camera Club.*

PHILADELPHIA, January 15, 1889.

} *Photographic Society of Philadelphia.*

AMATEURS—PROFESSIONALS.

BY P. E. W.

Is it not time to have a clear definition of the distinction between an amateur and professional? There are numberless persons in this city who are sailing under false colors. They claim all the power, influence and immunities of the amateur and yet are professionals in every sense of the word. Indeed, there are many persons in our great manufacturing establishments who are classed as professionals, because these contain photographic goods made in their works, who better deserve the name of amateur than some of these amateurs.

Perhaps the photographic world may, with profit, take a lesson from athletic circles and adopt the distinction which the latter have made. There the amateur is one who has never competed for money prizes, nor competed with men who have competed for money, nor trained men for money, nor in any way made money out of his athletic power or knowledge. In a word, just as soon as he uses his skill for money-making or brings himself to a level with the money-making professional he becomes himself a professional.

Now as long as the amateur societies have shown a desire to be strict in this matter let them apply the rule justly. Let any man who makes money out of photography take his proper position as a professional. No matter whether a man sells a dozen prints, patents a ground glass substitute, or sells an invention to a stock house on the sly, he is to all intents and purposes, and should take his proper place as a professional. Perhaps one of the most offensive features of these sham amateurs is the fact that they usually out-Herod Herod when anything is said about allowing some man with a doubtful position to become a member of some amateur society. His connection with the profession may be very remote and he may practice the art from pure love, never selling a print or deriving a penny's advantage from this knowledge of the art. Yet the outcry against such men is very strong, and they are made to feel that their presence as members of an amateur society would be most unwelcome.

Now there can be no harm in this very strict ruling. Perhaps there may be an advantage in it. But in any event justice requires that the athletic rule should be enforced. And all who derive an income from photography, whether it be large or small, or be paid in money or in kind, should be classed as professionals.

This would be a double advantage. It would make the beginner hesitate before he began to sell prints or negatives. The amateur of long standing would not rush to the patent office or to the stock house as soon as a good idea came into his head. It would relieve the professional to a very great degree from the unfair and always irritating competition of the so-called amateur. The latter, when desiring to step across the line and reap the advantages of income from his work, would then find that he had crossed a real and not imaginary boundary. The old proverb about having and consuming the cake would become a living fact well worth his consideration.

It is devoutly to be hoped that the managers of all our photographic societies, both amateur and professional, will give this subject careful attention, and take immediate action which shall clearly define the status of both amateur and professional, and cover these points, which have hitherto been almost entirely overlooked.

AMATEUR EMULSION MAKING.

BY E. H. LYON.

[Lecture delivered before the Boston Camera Club, December 10, 1888.]

(Continued.)

THE ripening of an emulsion appears to cause an organic change in the structure of the gelatine after digesting or cooking, which brings about a granular condition. I would describe it as a mealy condition. Herein lies the extreme sensitiveness of a gelatine emulsion. Out of perhaps twenty different ammonia formulas, nothing is said about the method of making the first A

solution further than to combine the ingredients ; and yet I find it is very important ; the resulting emulsion depends for its speed and excellence very much upon these first steps. For instance, if I heat the water and the bromide to a high temperature, and then add the gelatine dry, it will dissolve in a few minutes ; but the emulsion will not be as rapid as when it is allowed to swell slowly and then dissolve at a very low temperature. I consider 100 degrees as high as it is safe to go with a gelatine solution that contains alkaline bromide. I use a pair of cheap scales, which are sold at the stock house ; a piece of tissue paper should be used to weigh out each ingredient upon, throwing it away so that there may be no contamination ; and it is very necessary in dry plate making that everything shall be scrupulously clean.

In regard to distilled water: I have made a great many emulsions with the ordinary tap water, and I find that it answers the purpose very well, but still, at certain times, it will not give good results, although you may make a great many emulsions with it and not have any trouble. The ordinary tap water will sometimes contain iron and sodium, or there may be some trouble with the pipes, and if you make a poor emulsion it is very valuable to know what is responsible for the failure, and if the water is right to start with, of course you can look elsewhere for it. Snow or ice water would be preferable to tap water, but as you use such a small quantity any way, for every 100 grains of silver only 2 ounces, it is better to obtain distilled water and use that only. The washing of the emulsion may be done with tap water.

Now, as I said before, temperature is a very important thing, and if the formula says 100 degrees, do not allow it to be as high as 110, for gelatine has been well called an unruly beast.

In order to keep the emulsion at a uniform temperature while digesting use a small chemical stand provided with movable rings. The water bath may rest upon one of these, and, with a little practice, you will know about how far above the lamp it should stand in order to keep the water at 100 degrees. Of course the temperature of the room has something to do with that.

I would recommend the amateur dry plate maker to make small batches. Forty-five grains of silver will coat about a dozen 5 x 8 plates, and that would be as many as you would care to make at one time. And another thing, it is not possible to make two batches exactly alike. No amateur could do that. I do not think the manufacturers can do it, and the best way to secure an average speed in emulsions is to make a number of small batches and combine them. With four or five small batches combined, just before coating, you will get an average speed that will not vary much. You may have a number of batches ripening all the time. When you want to make a few plates of an evening, take a teaspoonful from each glass and melt together.

Only photographic gelatine should be used. This has been cleansed of fatty matter. Nelson's No. 1 soft and Heinrich's or Winterthur hard gelatine are the best. Hard and soft gelatine may be cut up fine with scissors and kept in tin boxes for use. Gelatine should never be dissolved by adding it dry to warm, ripened emulsion. It should first be allowed to swell for a few minutes and then dissolved at a low temperature. The last addition of gelatine to the emulsion, after washing and remelting, should never exceed what is necessary to cause it to set. The amount of gelatine in the emulsion should be such that when a drop placed upon a strip of glass is held against a piece of ice to set, it will have a

cheesy consistency when pressed with the finger. If it sets tough like rubber add water. I use equal parts of hard and soft gelatine all the year round for the final addition. Enough should be added to bring the total amount of gelatine in the finished emulsion up to 30 grains to the ounce.

The final addition of hard and soft gelatine having been made to the ripened emulsion, we proceed to filter it. Obtain an Argand chimney, which is simply a tube of glass about 7 inches long by $1\frac{1}{2}$ in diameter. Upon one end of the chimney stretch a piece of chamois skin (not sheep skin) which has been dampened with water. Two or three turns of a strong rubber band will hold the chamois skin on. Warm the tube over a lamp, pour in the emulsion, then, placing the mouth close to the open end, blow vigorously and the emulsion will be forced through.

The emulsion is now ready for coating. We next want some clean glass plates of the desired size. We may use old or spoilt negatives over and over again by thoroughly cleaning them.

After the old plates stand in a strong solution of washing soda which is pretty near the boiling point, for ten or fifteen minutes, then with a small scrubbing brush the films may be easily removed. By placing small clippings of wire or tin on the edges of the plates, they will be prevented from sticking together while in the soda solution. Have three basins of clean hot water handy, rinse the first plate in each immediately after removing the film, and stand in a rack to dry. When dry, polish the side to be coated with a piece of chamois skin moistened with alcohol upon which a little white has been dusted.

A level surface upon which to allow the gelatine film to set is the next requisite. A slab of marble or slate will do for this. It may rest upon three screws set in the table or bench. A small spirit level should be used in adjusting it. The slab should be as cold as possible when used. A little chopped ice may be allowed to stand upon it for a half hour previous to coating, or it can be chilled in a refrigerator. It is important to have the film set as soon as possible after coating, as the sensitive bromide will have a tendency to settle down from the surface of the film, making long development necessary in order to get density. It also decreases its sensitiveness. The best method is to place the freshly coated plate upon a perfectly level shelf in a refrigerating box, but this is not absolutely necessary.

Plates larger than 5 x 7 seldom have a perfectly plane surface, being more or less "dished." The emulsion should be poured upon the concave side and the four corners pressed down by weights before the emulsion has time to set. Of course a small spot on each corner has to be sacrificed when this is done, but plates having considerable curvature can thus be coated with a film of uniform thickness. As soon as the film sets, which it should do in three or four minutes, place the plate in a rack in the drying box. Use about one and one-half drams of emulsion to a 4 x 5 plate. A little practice will enable the amateur to pour about the right quantity upon the center of the plate without measuring. Guide the emulsion with a glass rod to the edges. Hold the plate on the extended fingers while coating, rocking it gently until the emulsion has spread uniformly. If the temperature of the room is below 65 degrees, the pile of clean glass should remain near a stove, or in a warm place long enough to take off the chill before coating, but the plates should never be appreciably warm to the touch. The drying of the plates will be a serious trial to the patience if the proper arrange-

ments are not made. The best drying box for the amateur should be made of a tin cracker or cake box. A tinsmith will put on an extra rim, which will make the cover light-tight. To each end of the box attach a 3-inch tin pipe, having at least two elbows to serve as light traps. Arrange a shelf or stand for the box near a chimney and connect one pipe with the flue. A strong draft of air will pass through the box. The inside of the box and pipes should be blackened with a mixture of lamp black and alcohol, containing just enough shellac to keep it from rubbing off. By placing the ruby lamp, or any lamp, under the horizontal inlet pipe a few inches from the box, the air is slightly warmed, and the drying is hastened. Do not let the temperature in the box exceed 80 degrees, or a tough, glassy film will be the result. The plates should stand in a rack in the direction of the draught, and at least three-quarters of an inch apart. A batch of plates will dry over night in such a box. They should dry with a mat surface, and will show no drying marks if the emulsion has been thoroughly washed and the draught is strong. A piece of mosquito netting smeared with a little glycerine or molasses and made to cover the open end of the inlet pipe will prevent dust from entering the box. This precaution is hardly necessary if there is no carpet upon the floor. As the amateur will probably make his plates in the evening, any room may be used that can be kept dark; but I advise him by all means to have a room, such as an unused chamber, attic or store-room, where he can leave his bench, chemicals, glass-ware and drying box in dark and inviolate seclusion during the day. A good dark room is of course the best place, although if very damp the plates will dry slowly. Extreme care is necessary not to contaminate the emulsion with any of the chemicals used in developing. There is a great difference of opinion in regard to the use of iodide in emulsion, and this is due to the fact that slight changes in manipulation where it is used produce such widely different results. My own method of using it has given excellent results. In the first place I find that 3 to every 100 grains of silver is as much as it is safe to use. I generally use about 2 grains.

Follow the formula previously given until ready to add the silver to the bromized gelatine; before doing so, add to the latter 1 dram of a solution of iodide of potassium containing 8 grains to the ounce. Do not shake the gelatine solution until you begin to add the silver. Proceed as directed in previous formula until the emulsion has digested at 100 degrees F. for one-half hour or until the blue stage is reached; then add 15 grains of swelled soft gelatine with which 10 drops of ammonia has been mixed just before using. When this has dissolved pour the emulsion into a dish to cool, but do not wash at once. Let it stand from ten to twenty-four hours. Then wash it, remelt and ripen for one day or more. This is a very rapid emulsion, giving fine negatives of portraits, interiors or landscapes.

In the above method the bromide has a firm hold upon the gelatine before the iodide is added. If the bromide and iodide are added together, a modification of the double salt is produced, which requires long digestion and is very hard to develop and fix.

I LOOK for and expect the BULLETIN every two weeks, just as much as I do my food.

J. W. PARKS.

I HAVE been more than pleased with the BULLETIN and wish it all the success it so richly merits.

C. H. HABERER.

OUR ILLUSTRATION.

THE pretty photogravure with which we illustrate this issue of the BULLETIN is from a negative sent to us by Mr. Julio Pou, of St. Domingo. The subject is one of those bits of nature that we all love, and may serve as a *motif* for some of our amateur picture makers.

PHOTOGRAPHY ON WOOD.

THE *Revue Photographique* gives the following directions for photographing upon wood. Take :

Gelatine.....	8	grams.
White soap.....	8	"
Water.....	500	c. c.

The gelatine is allowed to swell, dissolved on a water bath, and the soap is added to it gradually, stirring all the time. The mixture is filtered through muslin, a little zinc white added to it, and then rubbed well into the wood to be used and left to dry. The film should be as thin and equal as possible. The following solution is then applied to the wood by means of a broad brush :

Albumen.....	30	grams.
Chloride of ammonia.....	1.2	"
Citric acid.....	0.2	"
Water.....	24	c. c.

Whip the albumen to a froth, let it settle, and add (in order) the water, the chloride of ammonia and the citric acid. When dry, this film is sensitized by pouring on the following solution and spreading it with a glass rod :

Nitrate of silver.....	3.2	grams.
Water.....	31	c. c.

Pour off any excess of the sensitizer and allow to dry again. Print as usual. It is not necessary to overprint. When sufficiently exposed, hold the printed surface of the wooden block for three minutes in a weak solution of salt ; in this the print will become slightly paler. Wash, and fix for four or five minutes in a concentrated solution of hyposulphite of soda. Wash again for ten minutes in running water and dry.

I CANNOT get on without the BULLETIN.

W. A. MORSE.

WHILE interested in photography I feel I cannot get on without the BULLETIN.

G. HENRY SHEARER.

ITS course is ever onward and upward in the science of photography.

P. O. TERHEUN.

PLEASE renew my subscription to the BULLETIN for another year. It is improving every year.

A. P. HALLOCK.

I HAVE been a constant reader of the BULLETIN for the past two years, and have gleaned a lot of information from it.

N. A. CHAMBERLAIN.

THE BULLETIN is one of the photo publications I never think of doing without. Have taken it from the first number.

W. H. LOCKHART.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.O.S.**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE AMATEUR PHOTOGRAPHIC SOCIETY OF BALTIMORE.

THE first monthly meeting was held at the Physiological Laboratory of the Johns Hopkins University instead of the rooms of the society. The *President*, Mr. I. T. NORRIS, in the chair, stated that the meeting had been called at the above place for reasons that would be explained later on, and he suggested that the regular routine business be dispensed with and only matters of importance be taken up, and this on motion was adopted.

The minutes of the last meeting were not read and the roll-call dispensed with, but there were present about twenty-two. The following were elected members of the society: Professor G. L. Smith, James Sykes, Harry Strokhead and Reinold H. Eighner; and applications were received for membership from Mr. Devlin and Mr. A. S. Murry, which were referred to the Executive Committee to report on at the next meeting. The resignation of Mr. G. N. Hunting was read and on motion accepted. The *President* then stated that we were present at the request of Professor

A. H. Rowland, who would give us a talk on the solar spectrum, and that he could explain and demonstrate better at the University than at our meeting rooms.

Professor Rowland was then introduced, and afterwards explained that the spectrum was a highly polished metal surface composed of copper and pure tin, with infinitesimal parallel lines traced on its surface with a diameter of about 20,000 to the inch, and by which the rays of the sun or the flame of metals are refracted, thus forming the spectrum. The spectrum was then thrown on a screen by means of an oxy-hydrogen light, and we were shown all the colors of the rainbow, viz.: violet, indigo, blue, green, yellow, orange and red. Photographs of the spectrum were then thrown on the screen and the dark lines fully explained, as also the lines and colors of various metals, and the similarity of the lines and colors of the spectrum of metals to that of the solar spectrum, thus demonstrating the composition of the planet of light.

After these things had been fully explained an adjournment was made to the basement, where with much interest the members inspected the delicate little machine ruling 20,000 lines to the inch, and with a capacity of 40,000 lines, said to be the only one in the world capable of making 40,000 lines to the inch. Thence to the upper floors, where were shown shelves and closets filled with chemicals and costly apparatus for photography. Then to the dark rooms and to the rooms where are made the sensitive plates used in photographing the spectrum. Next, the refrigerator for keeping at a cool and even temperature the emulsions. Then the coating slab and the drying boxes, all of which were fully explained by the Professor, and critically examined by the members with wondrous interest.

We were then shown the rooms in which the spectrum is photographed, and the explanation was of absorbing interest to all. Here we saw how the flames or vapors of a metal, fused by a powerful current of electricity, are photographed. Bars of copper, iron and other metals were melted as though of wax, and so rapid was the combustion that the noise was similar to the rattle of musketry or small arms, and was trying to both the eyes as well as one's nerves. After many other matters were explained, a hearty vote of thanks was given to Professor Rowland for his kindness to the members.

No further business, the meeting adjourned.

HARRY C. WILLIAMS,

Secretary.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

CLINTON HALL,
19 Astor Place, New York.

REGULAR MEETING, FEBRUARY 5, 1889.

President NEWTON in the chair. The *Secretary* reported that he had received for the section a copy of the "Photographer's Society Reporter," "Photographic Eye," and the last number of Anthony's BULLETIN. He also read the following :

PHOTOGRAPHIC SECTION,
AMERICAN INSTITUTE.

DEAR SIRS,—We take pleasure in sending to-day a copy of Vol. XIX of Anthony's BULLETIN for 1888, which we would ask you to accept with the compliments of the publishers.

Yours very truly,

E. & H. T. ANTHONY & CO.

A vote of thanks was tendered to the publishers for all of the above named, and the chairman of the Executive Committee then reported the following as the programme for the next regular meeting, March 5th :

"The Early Days of Photography, with examples of its literature, apparatus and pictures ; also many pleasing reminiscences by some of the oldest members of the craft."

President NEWTON then introduced Dr. Roberts, who read a paper on "Flash-Light Photography as connected with Surgery and Medicine." This paper was listened to with marked attention and interest, and this interest was fully sustained in his subsequent experiments, illustrations and explanatory remarks. In this part of the work, Mr. O. G. Mason acted as his assistant, and Mr. Bedford as operator of the stereopticon.

At the conclusion a hearty vote of thanks was tendered to these gentlemen, and the section then adjourned.

LYNN CAMERA CLUB.

THE club held a special meeting January 15th, at which it was voted to make a set of negatives illustrating Lynn and adjoining places of interest, including Swampscott and Nahant, from which to make lantern slides, and with a written description of same, to be loaned to other photographic clubs in exchange for similar sets. It was also decided to hold an informal exhibition of prints at an early date, for which each member will be requested to furnish at least two prints for competition, and as many more for "exhibition only" as they please. A few negatives made on the new Carbutt films were

shown by one of the members. They were equal to glass and very light.

After the business meeting a few lantern slides, made by members of the club, were shown on the screen, followed by a very excellent exhibition of slides made by W. S. Briggs, of the Boston Camera Club. Mr. Briggs' slides were a rare treat for the members present, and they were unanimous in passing a vote of thanks to that gentleman for his kindness in loaning them.

The committee reported a number of demonstrations, and the like are booked for future meetings, and expect to see a marked increase in photographic interest this season. There will probably be an outing for the club on the 22d of February, weather permitting.

A SPECIAL meeting was held January 22d, and the application for active membership of E. W. Pecker was acted upon, and he was unanimously elected. After a short discussion in regard to the exhibition that is to take place at the February meeting, all lights were turned off, with the exception of a large red lantern, and a demonstration in making both dry plates for transparencies and lantern slides, known as the coffee or tannin plate process, was given by the President of the club.

The process, without going into the fine details, is as follows: A clean glass plate is coated with a solution of white of one egg dissolved in 40 ounces of water and dried by heat ; when dry the plate is flowed with collodion ; the plate is then ready for the sensitizing bath, which is a 40-grain silver solution, strongly acid. The plate remains in this bath until all the greasy lines disappear. It is then put into a dish of distilled water and allowed to wash a few minutes, in order to remove the free silver. From the distilled water, after being rinsed in plain water, the plate is put into the preserving bath, composed of a large teaspoonful of coffee dissolved in 10 ounces of water, where it is allowed to remain about three minutes and is then dried by heat. When dry the plate is ready for use, and may be kept the same as any dry plate or used at once as desired. One of the plates was exposed and developed with the pyro-silver developer, and gave a very brilliant positive, with exceedingly clear high light. After thanks to the President for the evening's entertainment the meeting adjourned, subject to call of the Secretary.

There will be another demonstration in plate-making, showing how to make emulsion plates, at a future meeting.

AN informal exhibition of prints was held on Tuesday evening, February 5th, and although the time given for the preparation of the pictures was very short, the quality and number shown was far ahead of the most sanguine expectations of the committee. There were about 120 prints in all, consisting mostly of 5 x 8 and 6½ x 8½ pictures, mounted on 11 x 14 mounts, and is a very fine collection, especially for so young a club, as most of the members are beginners with very little experience. Some of the prints are exceptionally good.

In the competition class only two prints were allowed to each member.

Mr. Hoyt showed views at Wood's Holl, Mass.; Mr. Coates, views on Ricker Mountain; Mr. Bacheller, an interior and a flash light; Mr. Darcy, a Lake George view and one at Howlet Pond; Mr. Russell, an instantaneous view on Flax Pond and one at the Marblehead fire; Mr. Rogers, pond at Middleton and Portecochere at E. V. R. Thayer's house; Mr. Breed, an interior and residence of Mr. Sprague; Mr. Pecker, bromide print of Biddeford Pool, and transferotype print of old mill. Mr. Fox, an old saw-mill and a mountain view; Mr. Drew, wood interior on Paradise road; Mr. Jeffers, instantaneous surf views; Professor Thomson, base-ball game and Jackson Falls, N. H.; Mr. Porter, a hanging scene and a mountain brook.

Each person present was given a chance to vote on the merits of the pictures and the result shows that they must have been very nearly of equal value. Mr. Darcy's Saugus view, a number of cows at Howlet Pond, Mr. Rogers' picture of the portecochere of E. V. R. Thayer's house and Mr. Bacheller's interior tied for first place. Mr. Darcy's view at Lake George, Mr. Coates' view on Ricker Mountain and Mr. Pecker's bromide print of Biddeford pool tied for second place. Mr. Russell's view on Flax Pond and at the Marblehead fire, Mr. Bacheller's flash-light—two gentlemen playing cards, Mr. Rogers' view of a pond at Middleton, Mr. Fox's view of an old saw-mill, Mr. Drew's wood interior on Paradise road, and Professor Thomson's base-ball game at North Conway, N. H., tied for third place.

Each person who voted was instructed to place the number of the picture they thought was the best on a card and drop in the box. The result shows that those present settled on thirteen different pictures as being the best in their estimation.

Aside from the competition pictures Mr. Darcy showed some thirty or forty views of

Lynn, Lake George and the White Mountains. Professor Thomson showed views of the Marblehead fire and other points of interest. One pair that attracted considerable attention was labeled "Sunshine and Storm," being the picture of a little child sitting in a high chair, in sunshine, looking as pleasant as you please, and in storm yelling at the top of his voice. Mr. Rogers showed some architectural and interior views. Mr. Jeffers showed some instantaneous views of the surf at Swampscott Beach. Mr. Pecker showed some bromide prints and transparencies. Mr. Drew showed some views of Lynn residences and transparencies. Mr. Russell some views of Medfield road, Woburn, Library and a Study from Nature. Mr. Bacheller, a panoramic view of the Marblehead fire, some detective shots on the Hudson River and a few Nahant views, also a few transparencies. Mr. Fox showed some mountain views and Mr. Coates some Vermont views. The prints are to be left hanging until the next meeting, and all who wish to see them can do so by application to any member of the club. The exhibition was declared a complete success, and any one wishing to see a good collection of photographs should gain admission to the rooms.—*Lynn Paper.*

J. W. GIBBONEY,

Secretary.

CASE SCHOOL CAMERA CLUB.

REGULAR meeting of the Case School Camera Club, Friday afternoon, February 8th. Election of officers was the first thing on the programme, and the Secretary was instructed to cast a vote for the present officials. Ernest Maxwell was elected a member. Corresponding Secretary Punnett gave an explanation of the principles and workings of the "Carbon process," and some of the members expressed their determination to try it. The subject for next meeting may be a demonstration of the "platinotype process" by Mr. F. A. Coleman.

MILTON B. PUNNETT,

Corresponding Secretary.

COLUMBUS CAMERA CLUB.

THERE was a full attendance of the Columbus Camera Club at the meeting held at their rooms Tuesday evening, February 12th. No business was transacted, and the entire evening was devoted to the entertainment of the members and a few of their friends by the Secretary. Several negatives were shown of various highly colored maps made on Carbutt's orthochromatic plates; the color values

were distinctly shown, and every detail brought out with great accuracy. Slides from these negatives were projected on the screen, and the different colored sections of the maps represented in their relative values. Two negatives made from a highly colored engraved plate (one a Carbutt B 17, the other a Carbutt orthochromatic) were passed around and then slides made from the negatives were shown on the screen. The superior quality of the slide made from the orthochromatic plate was very marked.

The Secretary then proceeded to the main part of the evening's entertainment, which consisted of a lantern exhibition of pictures representing the "Curiosities of Ohio," accompanied by descriptions of the objects represented. The illustrations were gathered together from a variety of sources: old wood-cuts, photographs, lithographs, and some from negatives. Going back to prehistoric times, the first illustration was of the skeleton of a mastodon, unearthed in Anglaize County, and destroyed at the burning of Barnum's Museum in New York City. Then followed a series representing the mounds, fortifications and other earthworks of the mound-builders. Next were shown a number of the curious natural formations in Ohio, as "The Devil's Tea Table," "Pompey's Pillar," "Rock Bridge," "Rock House," etc. After these came curious tree growths, as "The Big Sycamore," largest tree east of California, "The Wedded Trees," "The Twin Trees," "Old Man of the Woods," etc. Curious customs of the early settlers were represented, as "Niggering Corn," etc. Curious characters, as "Johnny Appleseed," "Mad Ann Bailey," "Lorenzo Dow," "John Gray," "Last Pensioner of the American Revolution," etc. Some sixty illustrations in all were given, and at the conclusion of the exhibition the club passed a vote of thanks to the Secretary.

The destruction by fire on Monday night of the Ohio State University laboratory entailed a very serious loss on two accomplished scientific workers in photography, viz.: Professors N. W. Lord and H. J. Detmers; the former lost over \$500 and the latter \$200 worth of photographic apparatus, besides many valuable negatives, prints and slides used in the illustration of their lectures.

The materials lost represented the accumulations of years of scientific work, which cannot be replaced, and were the personal property of these two gentlemen. The loss to the University is estimated at from \$40,000 to \$50,000.

FRANK H. HOWE.

ATLANTA CAMERA CLUB.

THE first outing of the Atlanta Camera Club was enjoyed on Election Day, the place visited being Stone Mountain, the well-known granite quarry of north-western Georgia. No place affords more unique subjects for the camera than this does, and every variety of picture was obtained, from the tranquil woodland path to the hazardous cliff, known as "Buzzard's Roost."

The second outing was on Thanksgiving Day, to Salt Springs, on invitation of the proprietor of the Sweetwater Park Hotel. The early part of the day was spent in boating down the Sweetwater, a river possessed of unusual variety and romantic beauty. At noon the party landed at Factory Shoals, a point made memorable in history from the complete destruction, by Sherman in his march, of the Manchester Manufacturing Company's factory, the grandest enterprise of its kind then in the South. It is a renowned landmark now, so grand a pile of ruin in so remote a forest region, and a fitting spot for enjoying dinner and its accompaniment of song and story. The return to the hotel was by means of mule wagons, and thence by rail to Atlanta.

Few trips could have been taken that could excel this in variety of subjects typical of the rural South; and the club expect soon to have their pictures in readiness for exchange with Northern clubs.

E. M. LINDLEY,
Corresponding Secretary.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the society was held Wednesday evening, February 6, 1889, with the *President*, Mr. FREDERIC GRAFF, in the Chair.

The Secretary reported that Messrs. E. & H. T. Anthony & Co. had presented to the society a bound copy of Volume XIX of Anthony's Photographic BULLETIN, and that Mr. George B. Wood had presented a catalogue, etc., of the recent photographic exhibition held in Vienna. Both gifts were acknowledged with a vote of thanks.

A package of tickets for use of members and their friends for a lecture on "Amateur Photography," by Professor Charles F. Himes, under the auspices of the Franklin Institute, was also received with the thanks of the society.

A report was received from the Executive Committee asking for an appropriation for

binding journals, etc., and also suggesting a plan for selecting each year from the work of members six pictures to be considered the honor pictures for the year, copies of which should be preserved by the society. As the plan, after discussion among the members, seemed to be imperfect in some of its details, it was referred back to the committee for their further consideration, and report at the next meeting.

The Committee on Lantern Slides presented the following report:

Your Committee on Lantern Slides beg leave to report that the lantern and slides belonging to the society have been turned over to its care by the Executive Committee, and it has entered upon the duties assigned to it under the By-Laws. As a first duty the committee report that it is ready to receive gifts of slides from members. Contributions have already been made by Dr. Ellerslie Wallace, William H. Rau, Henry T. Coates and C. R. Pancoast, of which detailed report will be submitted at the next meeting. The society has at present nothing which could be called a "permanent collection of slides," and your committee have a suggestion to make, which, if adopted by the members, will give a nucleus from which to start. There have come into the hands of the committee the slides contributed by members to the Interchange of 1887-88, about fifty-four in all. These are the individual property of members, but if contributed to the society will serve as a starting point from which your committee hope a valuable collection will grow. A list of these slides is submitted herewith.

In this connection the committee suggest the propriety, and recommend the formation of a special series of slides illustrative of the City of Philadelphia. There must be in the possession of members of this society negatives of places and buildings of the greatest historical interest, and a collection could easily be made (if the interest and co-operation of the members is secured) which would be of the highest value. The series would include views in the Park, as well as of public and private buildings in the city, and the historical importance of such a collection need only be suggested to be appreciated.

The committee have adopted a system of labeling slides which will preserve a record of the names of the maker of the negatives, and of the members presenting slides. These will be attached by the committee, or labels will be furnished to the members on application.

The attention of the committee has been

called to the fact that under the rules governing the American Lantern Slide Interchange, the society is required to elect a representative at its January meeting. As this was overlooked then, such an election should be held at the February meeting. The Interchange Slides to be shown at the conversational meeting, February 20th, are those of the Philadelphia Amateur Photographic Club.

At the last conversational meeting, January 16th, the slides of the Louisville and New Orleans Camera Clubs were shown. These were all gelatine slides, of fair quality, and those of the latter organization were of characteristic subjects of New Orleans and the lower Mississippi. Slides were also shown by Mr. David Pepper—some choice views at Bar Harbor; Mr. Frank H. Rosengarten, Mr. William H. Rau—animal studies at the Philadelphia Zoological Garden; Mr. Francis T. Fassitt—several fine foreign subjects principally; and some fine views in Germany and Switzerland, by Mr. O. D. Wilkinson, a visitor.

WILLIAM H. RAU,
FRANK BENNETT,
EDMUND STIRLING,

Committee on Lantern Slides.

The Committee on Membership reported the election of the following Active Members: John P. Anshutz, Elwood R. Kennington, E. M. Pine, Ogden D. Wilkinson and Frank S. Harris.

The Committee on Joint Exhibition reported favorable progress in their preparations. About two thousand circulars, with rules, etc., had been distributed to photographers and photographic societies in all parts of the world, and every effort was being made to secure exhibits of the very best photographs obtainable from all sources. Applications for space had already been received, which included a very prominent English photographer, who proposes to exhibit some fine work of large size.

The committees had in contemplation four evenings devoted to lantern slides. In addition to the slides sent for the regular competition, one evening would probably be given to the slides sent to the American Interchange by the Camera Club, of London, and it was thought that the remaining evenings might be devoted to slides representing work of our own members.

In accordance with the report of the Lantern Slide Committee, and as required by the rules of the American Lantern Slide Interchange, Mr. J. G. Bullock nominated Mr. W.

H. Rau as Director, to represent the society in the Interchange for the coming year, to which position he was unanimously elected.

The President appointed Messrs. John C. Browne and F. T. Fassitt auditors, to examine the accounts of the treasurer and treasurer pro tem. for 1888.

Mr. Burrows (a visitor) showed a form of lamp which he had advised for use with flash-light compounds. The powder was inserted on a small funnel-shaped receptacle, the bottom being connected by a rubber tube with the usual bulb. A short distance above the cup for the powder a metallic ring about three inches in diameter was suspended, the ring being wrapped with asbestos fibre. The asbestos was wet with alcohol, which, when ignited, produced a large flame, into which the powder being suddenly forced by pressure on the bulb, was instantly consumed with a most brilliant light. Powdered magnesium thus used was entirely consumed, with practically no smoke or residue. Mr. Burrows also showed another form of the lamp which could be used with one hand, a trigger releasing a piston which, actuated by a spring, gave the necessary puff of air to blow the powder into the flame.

Mr. Lewis called attention to the fact that with flash-lamps of similar construction to that shown by Mr. Burrows a small portion of the powder was sometimes drawn back into the mouth of the tube, which, on being ejected the next time the light was used an instant later than the main charge, was apt to make a secondary flash, which was undesirable if not detrimental to good work. To obviate this he recommended inserting a very small piece of absorbent cotton into the bottom of the powder cup, which being blown out with the powder would prevent any getting into the tube, and would also be entirely consumed with the powder. The cotton could also be used with lamps in which the flame was blown against the powder, to hold the compound and prevent any of it being blown away and not consumed.

Mr. Lewis also mentioned having been troubled by a plate frilling at the corners, which he overcame by applying blotting paper. He thus absorbed the water from the film, and by gently patting it the film was made gradually to adhere again to the glass in its original position free from ridges or other marks.

Mr. Earl showed one of Beck's wide angle lenses fitted with the Iris diaphragm, which had many excellent features.

Dr. Reed showed what was apparently an umbrella, but on removing the case and unscrewing the handle it proved to be a tripod for use with a detective or other light camera. The legs were formed of light metal tubes, each made in two sections so that it could be extended to the full height necessary for a practical tripod. The umbrella tripod was of English make.

Mr. Bullock mentioned that in toning some prints on a new brand of paper he was trying, on putting them into the fixing bath, which was of usual strength, he found the albumen immediately began to dissolve and leave the paper. Thinking the bath too strong he diluted it, only to make matters worse. A tea-cupful of salt was then added to the fixing bath, which instantly stopped the trouble, and excellent prints were obtained on paper which otherwise might have been condemned.

Mr. Wallace thought if the silvering bath was too weak, it was liable to cause the trouble referred to with some paper. He recommended the use of a minute quantity of alum in the silver bath to coagulate the albumen.

Adjourned.

ROBERT S. REDFIELD,
Secretary.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, JANUARY 8, 1889.

THE meeting was called to order at 8.15 P.M., *President* CANFIELD in the chair.

The *President*—As our *Secretary* is obliged by another engagement to be absent to-night, I suppose the minutes are not ready to be read. If some one will make a motion that they be dispensed with, it will make our proceedings more regular.

On motion of Mr. Charles Simpson, the reading of the minutes of the last meeting was dispensed with.

The *President*—The first paper of the evening, "The Detective Camera, and How to Use It," is to be read by Mr. H. T. Duffield. Mr. Duffield has been to a great deal of trouble to collect the material for his very interesting paper, and I am sure you will all be very much pleased with it.

Mr. DUFFIELD then read his paper. (See next BULLETIN.)

The *President*—Mr. Grisdale has a paper upon "An Easy and Effective Way to Make Lantern Slide Mats."

Dr. PIFFARD—Mr. President, it seems to me that in considering the subject of the "focus of

a lens," two points must be noticed, and one of them is the size of the image. You take a detective camera, a 4 x 5, with the ordinary lens that accompanies it, take a shot across the street, and you have the image of a man about half an inch high, hardly more than that. With a longer focus lens you will get it considerably larger.

Another point to be taken into consideration is, if you are going to photograph objects in motion, the further away you are from the object the less the motion will be perceptible; consequently the long focus lens will serve you where a short focus lens will not. It has been my experience that you often get into crowded corners where you have to use a short focus lens. My camera is adapted to two sizes of lenses. I use a $6\frac{1}{4}$ and an $8\frac{1}{2}$ inch. In some pictures I took last winter by flash-light in the slums, I could not have done anything with an $8\frac{1}{2}$ inch lens, but with a $6\frac{1}{4}$ inch lens my pictures were quite satisfactory. With ordinary work out-of-doors, I prefer altogether a lens of over 8-inch focus, and in many of the cameras you can use both lengths of lenses without very much difficulty; but there are cameras of some constructions in which you cannot. The kind of lens needed seems to me to go without saying.

As to the "finder": I have a finder on my camera—may be there are two. I never use them except for long range work. I don't need them, and for short range work I have never found a "finder" that registered with the plate. Mine doesn't in any of the detective cameras, and I have had four. As to the angle of view: the 30 degrees that has been mentioned is pretty small, I think; if you can secure a lens with 60 degrees and use F-8, you will have got about the maximum that you can use. The larger the angle the less the focal opening must be to give you a good, clear picture.

In regard to the range of the bellows: some of them mentioned $1\frac{1}{4}$ inches. I have 6 inches on mine, and with it I can take pictures up to one-third scale. In other words, an ordinary object would appear to be $2\frac{1}{2}$ to 3 inches high, and would come out very sharp. I think I showed a picture like that some months ago; and the smaller the focus of the lens, other things being equal, the sharper your picture will be.

Mr. ATKINSON—Mr. York, who has taken more street views for us than any other man, told me that he always used a lens of $2\frac{1}{2}$ inches equivalent focus. But you cannot take

a high building unless your focus is very short. Then, as regards the camera, it is almost impossible to make a "detective camera" that will be fit for a wide angle lens.

Now, the other question about the name of the "detective camera." It is an odious name to me. We all know what a detective is. It is one who worms himself into your confidence to betray it. It is a hateful name to me; a very hateful name. The inventor of the detective camera lives in Brooklyn. His idea was that it should be called the artist camera; that was the original idea. And allow me to say right here, that Mr. Beach, I think, has made a little mistake in his article in *Harper's*, in giving the credit to Mr. Bolas, the editor of the *Photographic News*, as being the inventor of the detective camera. No doubt Mr. Bolas invented a camera, which he used to sit on to take a picture. Then there was a prejudice against it, that it was not a detective camera in any way, and he made it about the size of a shoe-box. Then he had to put it on the ground, and there was no "finder" to it. But the camera which is now known as the "detective camera," the credit of its invention belongs to this side of the water. It was invented here, and when Mr. York was over here about four years ago he obtained two samples of detective cameras in order, so he said, to show them on the other side what a "detective camera" was.

Dr. PIFFARD—Who was the inventor of the detective camera?

Mr. ATKINSON—I will leave that for some one else to say.

The President—I am very glad to hear from Mr. Atkinson, because he is familiar with the early detective cameras. If there is no more discussion we will listen to Mr. Grisdale on "An Easy and Effective Way to Make Lantern Slide Mats."

Mr. GRISDALE—Mr. President, I have not prepared any paper to be read this evening, and I only get up to say that what I have to show here this evening does not require any elaborate preparation. The main object was to let the members know that the society has been in possession of a lot of brass mats cut in the different forms shown on this sample card. They are for the use of the members of the society. And the only other wrinkle that is new is the use of a printing frame in connection with the mat. The great difficulty was a constant slipping of the mat, and the difficulty of placing the card back in its original position and getting a true form cut. In this way you take a form, an ordinary quarter printing frame,

and cut your brass mat or form $3\frac{1}{2} \times 4\frac{1}{4}$. The object of that is that it prevents any "play."

It is much better to cut the paper $3\frac{1}{2} \times 4\frac{1}{4}$ than $3\frac{1}{2} \times 4$, because by so doing it allows you a margin to use if you bring your mats a little bit to the right or to the left when you mat a slide.

I am sorry that the cutter we have has become injured so that I cannot show you; but the point is to put in the brass mat and place the sheet of paper in behind it, then take the glass plate and put it in at the back, behind the paper; that secures the paper between the glass plate and brass form. You then place your back of the printing frame in. Now (illustrating) you have that in, so that there is no difficulty in cutting out the mat. You can cut a dozen sheets of paper that will cut thirty mats, for five cents. Now you have some idea of how the stock-dealer must suffer by selling mats at one dollar per hundred.

The *Fr. sid. ent*.—What do you use to cut out the paper mat?

Mr. GRISDALE.—The Robinson trimmer where the corners are round or ovals, and when the corners are square I use an ordinary pen-knife. You can't get into a square corner with a cutter. It won't reach it. That is all I have to say in regard to the mat; it was principally to call the attention of the members to the fact that we have those mats if you should want them at any time.

The *President*.—The interest in the matter of lantern slides is growing in the society, as our exhibitions bear witness, and doubtless there are a great many members that will take advantage of these mats.

Mr. A. Peebles Smith has a paper, I think, on the "Developer for Instantaneous Exposures."

Mr. SMITH.—Mr. President, I have no paper prepared to-night, but before speaking of development or developers, I will mention something relative to plates. Rapid plates of extreme sensitiveness that will possess any quality at all, are only made in the winter time. From now on to the first of March you will get a plate which will be unequaled in any make, and now is the time to lay in your stock for next summer. There are two kinds of plates: one a chemically quick emulsion, made by mixing everything cold, and a boiled emulsion. Boiled emulsions cannot be made in the summer time without decomposing the gelatine.

(To be continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—D. H. A. writes: Please inform me in next BULLETIN what is meant by glass paper

(for sharpening retouching pencils), and where it can be obtained. I am using hydroquinone for developer. After developing one plate it is as black as tar, but still develops fairly. Could this be the ebonite tray? Should we use the very hard pencils for intense or thin negatives? For a light or heavy hand? Is a good eliminator advisable for bromides? Is the iron solution fit for use after it has turned brown? And what is its effect on bromide in that condition? Why does the solution turn brown? Would a 10-inch condenser cover a 5×7 negative, illuminated by a kerosene lamp, and be suitable to make bromides with at night? On page 220 of BULLETIN for 1887, is a drawing with a ground glass, and double condenser, and the ground glass is recommended, is it better and stronger than the 10-inch single one? Is the double one on the market and by whom?

A.—Glass paper is a kind of rough paper very much like sand or emery paper. Sand paper obtained at any hardware store, if not too coarse, would answer the purpose, we think. The deep color of your hydroquinone developer is probably due to the action of the alkali upon the ebonite trays; yet we use these trays without any such trouble; the quality of the trays must be poor. We cannot advise you about quality of pencils for retouching; consult a practical retoucher. We do not think bromides need any better eliminator than plenty of good clean water. Brown iron solution is not good for a developer. Old iron developer mixed with some new developer is often useful when bromides have had over-exposure. It turns brown because the ferrous has turned into ferric salt by oxidation. A 10-inch condenser would cover a 5×7 negative, as you state, and can be used with a Cooper lantern at night. A double condenser gives much better pictures than a single one and is essential for good results. Write to our publishers about double condensers, etc.

Q.—S. T. B. writes: I enclose you four prints of flash-light negatives. Will you kindly let me know through the "What our Friends Would Like to Know," in the BULLETIN, what you think of them. I am an amateur. The main difficulty I find is that unless the subject is placed several feet from the background a shadow of the figure is "thrown on the screen," and it does not look "nice." How can I overcome this? I trust you will be able to enlighten me.

A.—The way to overcome the shadow difficulty is to use a flash-light of large volume by blowing the pure magnesium through a

large alcohol flame; or else use two flash-lights, one smaller than the other, the latter on the shadow side of the subject, the idea being to illuminate the shadows just a trifle. Using large white reflecting screens on the shadow side will also overcome the difficulty.

Q.—G. W. P. writes: Will you kindly examine the inclosed prints and give me your opinion as to the cause of the fog on the upper part of each, in your column, "What our Friends Would Like to Know"? This fog appears in all prints when there are large masses of shadow; the lights are always fogged, regardless of the sun's position. The print of large rubber tree with cocoanuts in the background was taken on a Carbutt "B"-plate, with six seconds' exposure, with a medium diaphragm, and developed slowly. One experienced photographer thought it was due to light in dark room, but it does not appear on instantaneous plates, which, being more sensitive, would show it more than the "B" plates. Another thought there was a flare spot in the lens. The plate before referred to was a No. 16 sensitometer.

A.—The trouble is probably due to a pin-hole in your bellows or a leakage of light in your plate-holders. Put a plate into the holder and place on camera as you would to take a picture. Now draw slide, and leave the camera alone for ten or fifteen seconds without removing cap of lens; now replace slide, and develop the plate. If you get a dark spot on plate the fault is in your camera or plate-holder. You can soon find out which by putting a plate in the holder, allowing to remain in a shaded place out-of-doors in daylight for ten seconds, and then developing.

Views Caught with the Drop Shutter.

WE regret to note the death of Mr. D. U. Morgan, for many years the head of the well known firm of albumen paper manufacturers. He died of pneumonia, at his home in Philadelphia, and was fifty-three years old.

A NEW DETECTIVE CAMERA.—New devices in the mechanism of cameras and composition of plates are constantly being offered to the photographers. Every day they have something new to try or talk about. The number of developers and their component parts is simply appalling to a beginner.

The Lilliput camera is a neat little picture taker of modest and unobtrusive appearance that was offered to amateurs the last week. As one of the first pictures taken with it was that of a small dog, it has been dubbed in the trade the "Little Pup." The camera is about the size of a cigar box, made after the satchel order, of light leather. It is a detective well adapted for street purposes. The operator presses a button under the box and the shutter flies open for an instant. Twelve plates are carried in the little box. During the strike it was used by a well known amateur with success to catch street cars loaded with policemen. The general idea to the casual observer was probably that the young man had a lunch box thrown over the shoulders. It measures 4 x 4 x 6 inches, and is fitted with a lens that is in focus for any distance. The Lilliput costs \$25, with the usual outfit of plates and necessities.—*N. Y. Times.*

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NEGATIVE BY ROCKWOOD,

PRINTED ON N. P. A. EX. BRILLIANT ALBUMEN PAPER.

“MABEL HOARE, AS MAMILLIUS.”

“IN THE WINTERS TALE.”

Mary Anderson Company.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

MARCH 9, 1889.

Vol. XX.—No. 5.

TRANSPARENCIES AND BROMIDE PRINTS WITH HYDROQUINONE.

THERE are many points of resemblance in the management of the development of both transparencies and bromide prints. In each case the emulsion is usually a slow one, made so as to give strong contrasts of light and shade. In the transparency this means that the high lights shall be clear glass, and for bromide prints the white parts of the picture must not be fogged.

Up to the present time these results have only been attained with certainty by using the ferrous oxalate developer, and the use of some organic material, such as citric acid, as a restrainer, and to preserve the high lights from fog. Quite a number of attempts have been made to use pyrogallol for the production of transparencies and bromide prints. In some hands this has been successful; but in the majority of cases the use of pyrogallol for transparencies has resulted in positives of a brown color not always suited to the subject, and in the case of bromide prints, in addition to a disagreeable brown color, there has generally been a difficulty in obtaining clear high lights.

With the advent of hydroquinone and the use of better varieties of it, made possible by the increased demand, we are now able to compound a developer that is almost universal in its applications. The negatives produced by the use of hydroquinone are certainly as good as those made with pyrogallol, and the danger of fogging them is very much reduced by the less rapid action of the new developing agent. There is only one danger that occurs to us in using hydroquinone, and that is, the light of the developing lamp has a better chance to exert its influence upon rapid plates, owing to the lack of color in the developer. With pyrogallol there is quite a protection in the color of the developer, the brown tint being very non-actinic. We believe that a number of the early failures with hydroquinone were due to the use of too much light while developing rapid plates. In the case of slow plates for transparencies and also in the case of bromide prints, this danger is not likely to occur. Nevertheless, a cautious use of the light when developing with hydroquinone is to be recommended.

The use of hydroquinone for making transparencies and bromide prints has led to some very beautiful results, especially in the former case. Its slow and uniform action, the ease with which the picture comes out, the entire freedom from fog, and the particularly handsome black and white tones obtained

with it, have won for it many friends that looked askance when it was first proposed as a developer. Another great point in its favor is the fact that it loses its strength very slowly and can be used a great many times before it is useless. This latter fact makes it really cheaper to use than pyrogallol, although the first cost may be greater. We do not care to give any special formulas for the development of transparencies or bromide prints. The quantities of hydroquinone may vary from two to five grains in the ounce of water; the alkalis may be carbonate of potassium or carbonate of sodium or both; or potassic hydrate or sodic hydrate may be used. But in all cases sulphite of sodium is needed to secure the best color for the pictures, and in many cases citric acid or potassium bromide is found useful as a restrainer. Within certain limits the use of more alkali will allow of the reduction of the quantity of hydroquinone; but great care must be taken, as the warm weather approaches, that the use of excessive quantities of alkali does not cause frilling.

Some very beautiful results that we have lately seen, obtained by the use of hydroquinone, have called forth the above remarks about the new developing agent, and we hope they will lead our readers to try it for themselves. We are more than ever satisfied that hydroquinone is destined to supplant pyrogallol.

EDITORIAL NOTES.

THE third annual joint exhibition of the photographic societies of Philadelphia, Boston and New York, which is to be held in the Academy of Fine Arts, Philadelphia, promises to be better than anything of the kind hitherto attempted by the three societies. Exhibits should be delivered to Mr. John G. Bullock, 523 Arch street, Philadelphia, by March 25th next. The exhibition is to be held April 8th to 20th next.

A VERY unfortunate accident with the iron cylinders used for projection apparatus occurred lately in Dublin, Ireland. It appears by some mischance the gas in the oxygen cylinder (which should contain oxygen gas only) became mixed with coal gas, and the unfortunate victim, Mr. Bewley, lost his life on lighting the gases issuing from the cylinder. Our English contemporaries contain long reports about the accident; but, like all misfortunes of this kind, the man who could tell us just how it happened is no longer able to give his evidence. One thing strikes us very forcibly, and that is the unnecessarily high pressure (1,200 pounds to the square inch) which our English cousins are using on their gas cylinders. This form of illumination has been used for a long time in the United States, and we have only heard of one or two accidents in twenty years. We believe this is largely due to the fact that much lower pressures are used on this side of the water. With a pressure of two hundred and fifty pounds on the square inch the gases are much more easy to control than at a higher pressure.

IN the *Moniteur de la Photographie*, M. Balagny recommends two sheets of glass, yellow and green, as a substitute for the ruby variety for use in the dark room. One glass is apple-green (cathedral green) and the other is yellow glass ground on one side to diffuse the rays. The best variety of yellow glass is that obtained by the use of silver oxide. M. Balagny does not claim that this light

is safer than the ruby lamp ; but from his experiments with plates it is just as good, and very much more agreeable to the eyes.

THE Providence Camera Club are about to locate in new quarters, and will probably have the best arranged suite of apartments for photographic work in the Eastern States. We shall try to find space for a description of their new rooms in an early issue of the BULLETIN.

SOME time since we received a very handsome calendar from the publishers of the *Photographic Times*. It adorns our sanctum and is a constant source of pleasure and usefulness. The design is a circular disc with the days of the month and a pointer to indicate the date. We tender our best thanks to the publishers of our contemporary for their kind remembrance.

THE Montreal Amateur Photographic Club will hold its second annual exhibition of photographs in April next, and desires contributions from all amateur photographic clubs in this and foreign countries. The pictures desired are those made by different printing processes. Prints may be mounted but not framed, and are sent and returned at the expense of the club. They should be sent to J. W. Davis, 2204 Catherine street, Montreal, Can., before March 30th next.

THE Watertown (N. Y.) Camera Club was organized January 30th last, with the following officers: *President*, H. M. Hill; *Vice-President*, J. E. Knowlton; *Secretary*, George I. Woolby; *Treasurer*, L. E. Child. As most of the members of the club have been at work for two years, much good is expected from the organization.

THE following lines speak for themselves : "The Photographic Merchants' Association, in annual session at the Burnet House, Cincinnati, in looking back over the events of the past year, recall with sorrow the loss you have met in the death of Mr. Edward Anthony. We hold his name in grateful remembrance and rejoice over the many pleasant memories which come to us and to you for his noble living.

Fraternally yours,

GEORGE R. ANGELL, *President*.

J. C. SOMERVILLE, *Vice-President*.

J. H. SMITH, *Secretary*."

The Photographic Beacon, after some months of obscurity, again beams forth in a new dress, and with better prospects of continued usefulness. It is now in the hands of a stock company, and with Dr. Nicol at the helm again will be welcome to our table.

[From our Special Correspondent.]

ENGLISH NOTES.

OUR novelists continue to make effective use of photography. In that splendid story, "A Dangerous Catpaw," by D. Christie Murray, which has been running in *Longman's Magazine*, the wealthy heroine, Miss Pharr, is "gone" on photography, which has also been the life-long amusement of a venerable Scotch doctor who figures in the tale. Taking photographs—for practice sake—one Sunday afternoon, out of the drawing-room window of a

country house, they leave the development for a future day. On the same day Miss Pharr's jewels are stolen, and her suitor and admirer—the clever barrister, Wyncott Esden—who is supposed to be in London, is summoned to aid in the discovery of the thief. We cannot follow the story in detail, but when the old doctor comes to develop and study his negatives, he discovers peering out from the shrubbery which faced the drawing-room window the tortured and agonized face of Esden, who was lying in wait there, and to whom the guilt of the burglary is traced.

A writer in the *Boys' Own Paper* treats the subject in a lighter style. A boy at boarding-school is in the habit of escaping from the play-ground by vaulting over the wall while the master's back is turned, returning in like manner. But, unfortunately for the truant, another boy at the school is engaged in taking instantaneous photographs of a lad playing cricket, the wall being the background. The master, by chance, assists in the development of the negative; and there—just astride the wall—is seen the wanderer, who is greatly surprised when he receives a heavy imposition for the escapade which he feels certain the master never witnessed !*

In astronomy, photography is doing most marvelous work. Every one is familiar with the nebular hypothesis first formulated by Laplace, which explains the origin of the solar system as due to the condensation and rotation of an enormous cloud of matter—a nebula. Rings of matter are thrown off in succession, which, gathering together, form the planets, while the central part of the nebula remains as a sun. Mr. Isaac Roberts, of Maghull, near Liverpool, who has been doing magnificent work in astronomical photography, has recently obtained a photograph of the great Nebula in *Andromeda* by an exposure of four hours with his 20-inch reflecting telescope, which actually shows a new system in the act of formation. There is a central mass of condensed nebulous matter; outside this are one or two irregular rings, and further still from the center, spots of light which doubtless represent an early stage of planetary existence. In fact this nebula in *Andromeda* is now passing through the stage in which our own solar system was, say a million million years ago!

Hydroquinone continues to advance in favor as a developer, both for plates and paper. When used with sodium hydrate it is powerful and rapid, but for lantern-plate work I prefer a mixture of equal parts of sodium and potassium carbonates as the alkali. Since hydroquinone is a universal developer, answering both for plates and paper-positives, I believe it will eventually displace both pyro and ferrous oxalate. Its price has now been reduced (in England) to two shillings per ounce, and since the same solution can be used over and over again until the liquid is exhausted, it is already the cheapest developer of all. It combines the latitude of exposure of pyro with the freedom from stain and good color of ferrous oxalate. The developer should be made up rather strongly, say 6 grains each of hydroquinone, potassium carbonate and sodium carbonate, with 24 grains of sodium sulphite to every ounce of boiled distilled water. To each ounce of this developer 4 drops of a 10 per cent. solution of potassium bromide may be added.

Those who like clean, unstained negatives should not only use distilled water to make up the developing solutions, but should boil the water for ten or fifteen minutes in a clean glass vessel before using. This boiling expels the

*Imposition is, the setting of an extra task of study for misdemeanor.

dissolved air present in the water and which is the chief cause of discoloration of the pyro. Even if distilled water is not used, boiling the water improves it by getting rid of the air, and also of much of the salts of lime, etc., of which a certain proportion occurs in almost all spring or well water.

A new photographic publication has just been announced—"The Photographic Societies Reporter," monthly, price four pence—in connection with the "Amateur Photographer." It is intended to contain in full the many papers now read before our Societies, most of which at present are "born to blush unseen" and die unread. The chief objection which occurs to me is that the average paper is not worth publication. It is made interesting, perhaps, to those who hear it delivered by the personality of the speaker, and by the experiments and illustrations which he exhibits; but for the most part such papers are only a *rechauffé* of well-known facts. The editors (Messrs. C. W. Hastings and Lionel Clark) hope that the prospect of publication will make all the authors prepare their papers more carefully, write them out neatly beforehand, etc. I fear they are sanguine men!

Many of our best workers are preparing papers for the second volume of "Anthony's International Annual," which I am glad to hear is to be published this year as early as Whitsuntide. The first volume is acknowledged by every one to be the most valuable of its class ever issued. It is already becoming scarce and copies are certain to be at a premium in the future.

A feature of the winter here has been the multiplication of photographic societies. Every large town now has—every village bids fair to have—its "Camera-Club" or "Photo Association" or "Society." This is quite right; but I regard the multiplication of societies in the same town as an evil. Better one strong society than two or three weak ones. In this connection the old questions of amateur and professionals crops up again. By all means let the local society be broad enough to include all. There are black sheep in every fold, and it must be confessed that some of our professional brethren are very nigrescent; but you need not fear their desiring to join your ranks; the subscription will keep them out, and besides, there is the ballot box. Some of the best, ablest and most gentlemanly men I ever met have been and are professional photographers. I have wandered in many parts of these isles, and have invariably received help with kindness from local professionals. We are all engaged in one pursuit, therefore let us mingle as friends, and learn or teach as best we may.

With respect to competitions the matter is different. There I would rigidly separate the professional from the amateur. I see our new journal, "Photography," has taken a paragraph from one of my former communications to the BULLETIN, and invites a special discussion in its pages as to the definition of "an amateur photographer." Well, I stick to my guns, and again declare "that the man who accepts money—to be devoted to his own personal benefit—for photographs of his own making, cannot be considered an amateur." Why, the very word "amateur" means a person who does a thing for "love," and those who play lawn-tennis know that "love" means "nothing"! If Lord Robert Grosvenor had lived—poor fellow! he died an untimely death in Palestine a few months back—we should have heard more of this question, for he had just founded an Association of Amateur Photographers, who were to take and sell photographs for the benefit of charitable institutions; but with his death the whole thing has come to an end. In such a case the amateur would, according to my defini-

tion, have still retained his status, for the sale would not have been for his "personal benefit." But I think the plan would have been open to abuses and it would certainly have injured many struggling professionals. That we may all "live and let live" is the wish of

TALBOT ARCHER.

COLUMBIA COLLEGE EXHIBITION.

(Continued.)

MR. ALGER C. GILDERSLEEVE showed some very interesting work in the application of photography to surveying. Taking a base line on the roofs of some houses on 48th street, New York, he has made quite an accurate survey of the surrounding section of the city, and constructed a map of the district. This exhibitor also showed a number of platinotypes by the new process. These are only fairly good; but the fault is in the process; we have yet to see any better. We also noted some excellent views in Central Park and on New York Bay by the same exhibitor.

Gustave R. Tuska had on exhibition a number of photographic reproductions of oil paintings, rather an ambitious piece of work, but fairly good. These were Rosa Bonheur's "Horse Fair;" "1807, Friedland," and others. Among other good pictures we noted an excellent interior of the Studio of the Architectural Department of Columbia College; a very pretty view of "Fawn's Leap," in the Catskills; and a "Farm-yard Scene" at Cornwall, N. Y.

W. W. Whitfield exhibited a number of interiors of the laboratories and museums of the School of Mines that were only fairly good, owing to some bad halation; the chemical museum was the best.

Among a number of other pictures by the same exhibitor were some very good ones of the blizzard last March, a number of groups on steam yacht and of School of Mines classes, all of which were excellent.

C. H. Young had a number of 8 x 10 views taken in the Adirondacks that were particularly good, excellent in every way.

C. Ed. Gudewell had several excellent views of the new bridge across the Harlem River, and a very good one of a locomotive leaving Profile Station.

Dwight W. Taylor had an excellent interior view looking out upon a piazza. Also a bridge view with some exceedingly fine work upon foliage.

Dr. H. T. Vulté had a number of pretty and interesting children's pictures, the best of which was a child with a pug dog on some steps. A group of white Brahma hens was also very good indeed.

A. L. Levy showed several fine views of Washington Bridge; also a number of pictures of Manhattan Beach scenes that were very good. The snow scenes and those of the blizzard were also excellent.

T. L. P. Luquer exhibited an excellent group of fifty or more Sunday-school children, and also a very picturesque view of St. Matthew's Church. Both pictures were very good, and that of the church was very well caught from an artistic standpoint.

Julien Townsend Davies had a number of fine views taken around Newport. "The Haunted House," "Purgatory" and "Old Mill" were excellent. The same exhibitor also showed "Chain" and "Sheet" lightning pictures. As a study "?" was very good. It was an amateur photographer on his knees before a lady, we presume proposing. Another good shot was an instantaneous view of a Lawn-tennis Game.

J. S. Hoyt had a number of excellent 8 x 10 interiors, one taken with the magnesium flash-light being very good indeed. A group, an operation in the hospital, was also very good.

C. F. Walker, though last, is by no means the least of these active young photographers, and his 5 x 8 views of Catskill scenery were all good and some of the best in the exhibition.

Altogether the exhibition must be pronounced a decided success and an advance over former years.

Taking out the work of a few of the members, we must confess that the most important work for most of the exhibitors to learn, is good printing. Many of the prints were muddy, flat, over-toned, brown, and generally anything but pleasing to look upon. There was many a good negative spoilt by injudicious printing. Furthermore, Ralph McNeil and a few others can well serve as models for the balance of the members in the matter of mounting prints. A poor print well mounted often looks better than it really is; but a good print badly mounted is an indication of carelessness and a limited idea of artistic taste.

What we have said is in no fault-finding mood, but with the idea that much of the good energy of the society might be put to useful purposes in the directions we have indicated, better prints and better mountings.

GETTING A CAMERA INTO CANADA AND GETTING IT OUT AGAIN.

BY J. B. BARLOW.

(Continued.)

OUR next visit was to the telegraph office, where we wire the baggage man at Windsor, and after waiting nearly an hour, receive word that it (the camera) will be in Hamilton at 1.50 P.M. Cheering news at last, but in the meantime will Uncle conclude we are not coming to-day and return home without us? We discover at this opportune moment there exists a dummy line between Hamilton and Dundas, and in a very short time we are rattling out of the city behind a snorting little engine. This ride was delightful, and not at all like what one would expect from the general idea of slow and sure old Canada. The road-bed is a little the crookedest I ever rode over, and the way we were yanked around corners, pulled up a sharp little hill only to be rushed down the opposite side, and swayed and hustled, would have entirely filled the views of a very live Yankee. At Dundas, at "Barney Collins" Hotel, we find Uncle patiently waiting. There we take our dinner, when, leaving my wife to rest until our return, my uncle and myself take the dummy line for Hamilton, and soon are again climbing those three flights of stairs at the Custom House, only to be confronted with the intelligence that we must visit the Assessor of Duties and have an "assessment made"—in other words, that functionary would inform me the amount of duties I would be requested to deposit before I could obtain possession of the camera, which amount would be returned when I got ready to leave the Dominion. So we again "traveled around the corner," and his royalty the "Assessor" states the amount to be forthcoming as ten dollars, which must be left with the Collector of Duties, which means another visit up the "three flights of stairs" where I am relieved of the ten dollars, and am furnished with a "claim" for the deliverance to me of the camera. Now we are "getting there," evidently, and with lighter hearts we make another trip

"around the corner" to be very calmly informed that "my camera will be found at the baggage-room at the depot"—distance of about a mile and a half. "Shades of Moses," how I should have liked to fire off a few cuss words about then, but funny as it was getting, there was no help for it; so, accompanied by one of the Queen's officers we visit the depot, this officer regaling us all the way with the latest news pertaining to the prize ring, and worse than that, he would fire questions at us relative to the same subject, about which we were as conversant as we were of the inhabitants of the planet Jupiter; but it would not do to let the man think otherwise than that we were bosom friends, or at least ardent admirers of J. Sullivan, Jack Kilrain and the whole prize-ring fraternity. How we did rack our brain for some blood-thirsty piece of pugilistic news for his delectation, and how we did shake in our boots every time the villain asked us any question for fear he should discover we were such rank impostors and tyros in his pet field. But luckily we struggled through it safely until we reached the depot, and at length, *at length* we get our hands on that precious canvas carrying case—with an ominous jam, to be sure, on one corner, but still *the case*, which, as a sort of finale, must be opened for inspection—there might be a "house and lot" or a "Fenian" inside. We find on taking off the cover our outfit all O. K. except the trifle of the ground glass, which is smashed into 473 separate and distinct pieces. Right here I had occasion to use a little King's English? Oh, no! but too heartily thank some kind brother amateur for the hint given in some photographic journal which I had read, to always in going on a trip take along an extra ground glass. I had done so, and here I stood at last—at last with camera safely in Canada. I did not trouble myself as yet about getting it out again, but going on the theory of—"Sufficient unto the day is the evil thereof," abandoned myself to the pleasure of capturing all the views possible, from Dundas (around which little town are some of the finest rock scenery views to be met with anywhere) up into the country as far as Galt, a distance of 20 miles.

After a delightful visit of a week among relatives, old friends and old views, my wife and myself could have been seen one fine morning again climbing "those three flights of stairs" at the Custom House in Hamilton. We left our camera, received the ten dollars and proceeded leisurely toward the depot. The camera was to soon follow us, when from one of the officials (just exactly what he was we have forgotten) we were to receive a paper and check which would deliver to us the camera at Niagara Falls. Well, we waited and waited until we knew we would not have time to get up-town to the Custom House, where probably our camera was calmly reposing just where we had left it, and back again to the depot in time for the train, so we sat quietly, "saying nothing, like Paddy's parrot, but keeping up a divil of a thinkin'," until we saw the train which we expected to take at about 12 o'clock, for Niagara Falls, pull out of the depot. We could have danced a jig on the ashes of that Canadian Custom House at that moment with perfect, simple and unadulterated happiness, but we didn't—not much—we just took ourselves up-town again and found that camera not removed by one hair's breadth from the spot in which we had seen one of the Queen's supernumeraries plant it in the morning. We entered some (mild) protests, we were still in their power, but did not leave until the camera in the hands of that "bloodthirsty pugilist" accompanied us. Probably the presence of my wife forbade the opening of the prize-ring subjects again, for very little was said on the road to the depot, where, in due course of time, we got every-

thing properly arranged, and about 6 o'clock found us aboard for the Falls. We had no serious trouble there with the box more than being obliged to open up the canvas cover and show its contents. In an old dry plate box were all my undeveloped Canadian views (paper films), and my heart came into my mouth when the official touched this box and pushed it one side to look at the empty holders beneath. Of course the undeveloped films were not dutiable, but if he *had* asked to see the contents of that box, what *would* I have done? He did not ask it, however, and a few minutes after we stepped from the train with the camera in my hand, once more on American soil and out of Canada. We had visited the Falls before, and as we only intended staying through the following day, our first business in the morning was to consign that precious camera by express to Alexandria Bay. Our route would take us back into Canada, across Lake Ontario to Toronto, and thence by rail to Kingston, where we would take the morning boat to our destination, but we did not care to take along the camera—no thank you—"enough is as good as a feast," you know.

We spent a very pleasant day around the Falls, and early the following morning took the New York Central cars down past the gorge of Niagara River, past Brock's Monument, and to Lewiston, where we boarded the "*Chicora*" for the trip across the lake, which was delightful, it being a very pleasant day, and about 11 o'clock we again set foot on the soil of her Majesty's Dominion, or rather on the docks, amid a pushing crowd of officers, hack-drivers and others. We were making our way along with the crowd, when suddenly I felt a hand laid on my arm, and a voice said, "What is this?" I turned and beheld by the silver badge on the man's cap that I was again in the clutches of a Custom House officer. I followed with my eyes the direction in which he was pointing, and calmly answered: "That? Why, that is a tripod." I had not sent it with the box by express, but had it wrapped up with my wife's umbrella. The next question came quickly, "Where is the camera?" He was evidently posted. I may have displayed a trace of bitterness as I replied, "The camera, I hope, is a mighty long way from here. It was," I continued, "sent by express from Niagara to Alexandria Bay." "All right," came the answer, "go ahead," and we "go-ed."

We spent the afternoon in Toronto, a live, pushing, busy city, and took train the same evening for Kingston, where we were awakened by the porter of the sleeper the following morning between 4 and 5 o'clock, and were shortly on the forward deck of "*The Passport*" en route for Alexandria Bay, which place we reached at 7.30 A.M., a short water trip, but very pleasant.

I will not prolong this paper with any description of our stay of two weeks among the Islands. Suffice it to say we found our camera in good order and made good use of it; but the writer is now a firm believer that what we chiefly need with Canada at present, is annexation.

PRINTING OUT OF A NEGATIVE IMAGE IN THE CAMERA.

BY W. E. PARTRIDGE.

SOME recent experiments in plate making with Professor Newberry's formula we think are well worth recording, as a visible image was formed on the plate in the camera. The proportions were those which the Professor published some time since in the pages of the *BULLETIN*. The object in making the plates was to obtain negatives with as fine a grain as possible. Speed was not deemed of any

consequence, and no effort was made to obtain any rapidity beyond that which comes with cold emulsification, so called. The directions given were followed very carefully until the second batch of gelatine was added. Then by an accident in weighing soft gelatine instead of hard was used and the quantity used was five times as great as that called for in the formula. No effort was made to follow directions further. The mass was washed and melted afterward and the coating of plates at once begun. Four drams of melted emulsion were given to each 5 x 8 plate. It was supposed that the silver would be so greatly diluted by the soft gelatine that a larger quantity of the emulsion would be needed. The coating was successful and more than usually perfect; very few bubbles or spots were found. Drying, from an imperfect arrangement of the drying box, was very slow. Some of the plates did not become perfectly dry for more than a week.

So far there was nothing unusual noted except an exasperatingly slow drying. On a dark day in November, near the end of the month, one of the plates was exposed upon an interior. The subject was a group of plants near a window. On taking the plate from the holder in the dark room several strange spots were noticed. Though rectangular in shape, they were supposed to be spots made in coating until they developed into well defined windows in the negative. Another exposure on the same subject at 3 p.m. was then made. Time, ten minutes. Lens $6\frac{1}{2}$ x $8\frac{1}{2}$ Rapid Rectilinear Dallmeyer, wide open. The result was an image on the plate, faint but distinct, showing the window outlines, bars and the plants as light against the dark part representing the sky. In a word, the plates gave a negative by printing out directly. This emulsion when exposed to light prints at once to a deep blue gray. Negatives made upon the plates appear very thin, but print considerably better than they look. At first a considerable difference in density could be seen between those portions which dried first and those which took a week to become hard. This distinction, however, appears to be disappearing as the plates become older.

Further experiments in this line appear desirable. Possibly some of our older experimenters can contribute facts or experience which will throw light upon this subject. At present, so far as we know, this is the first case where the negative image has been visible in a gelatine plate after exposure in the camera before development. These plates are apparently much more rapid than the estimate given by the Professor in his articles. By rough calculation we assume them to be as high as fifteen or sixteen sensitometer, or about the same speed as Carbutt's B plates.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

BUFFALO, N. Y., February 22, 1889.

To the Editors of the BULLETIN:

As it may be of interest to members of the Photographers' Association of America to have some idea of the awards and a description of the members' badges intended for the coming convention, the following is now submitted: The grand award, which is to be presented for the best collection of photographs illustrating Longfellow's poem, "Evangeline," is to be the original bronze cast figures, about 3 feet in height and known as "The Roman Wrestlers," which was exhibited at the Paris Salon, where it was greatly admired and gained "honorable mention." The original was imported free of duty, and not even European copies can be now had of it, unless at very much enhanced price.

For the medals a design has been secured which is entirely new and unique.

On the obverse side will be a fine head of Daguerre in bold relief, and on the reverse figures representative of American photography.

The die is to cost \$250, and the medals are to be of gold twenty-four carats fine and finished in dead gold.

They will be placed in the shape of a badge with bar of gold at the top for an inscription of the winner's name.

Members' badges are to be of solid silver, oxidized, embellished with head of Daguerre, and may be worn suspended from coat lappel, as common with other badges.

They, alone, will be intrinsically worth the admission fee, while as souvenirs of the "Semi-Centennial of Photography," only possessed by members of the Association, they will be permanently invaluable.

Very truly yours,

H. McMICHAEL.

TRIALS AND TRIBULATIONS OF THE PHOTOGRAPHER.

BY ABRAHAM BOGARDUS.

[Read before the Society of Amateur Photographers of New York.]

Now, ladies and gentlemen, I have been asked to talk on the "Trials and Tribulations of the Photographer." Well, I stood it for forty-one years, and I should be very sorry to undertake to tell you all of them. (Laughter.) It might take me another forty-one years to get through with it. But, fortunately or unfortunately, I generally try to make the best of everything, and what might have been a trial to many, I endeavored to laugh off.

I was told that the business was very unhealthy, but I tried to laugh and grow fat. I commenced at a hundred and twenty-five pounds, and finished at two hundred; so that it was not very unhealthy in my case.

In speaking of the daguerreotype (and we have just listened to a very interesting and a very excellent address) I want to say that I was a practical daguerreotype from fifteen to seventeen years, and in looking over some old books of account, I believe that I made and sold to the public 200,000 pictures. (Applause.) So that I am something like the boy eating pie—I have had an enormous experience. (Laughter.)

I well remember the 17th day of October, 1846. I placed at my door a little frame. I think it had four pictures in it, and at that date the people were very much interested in the daguerreotype. It was the "wonderful silver picture," and you would hardly have time to hang your frame out in the morning before there would be large crowds around it, all anxious to get a sight at the wonderful picture, and at that date a man who made a good daguerreotype was looked on as a scientific man. He was not a mere "machine worker," as photographers are called to-day.

I believe that not only in talking of photography, but in writing of it, there is too much latitude nowadays, and too much fancy writing. It is not practical enough. It is quite amusing to me to read six or eight or ten columns in one of our photographic journals written by some young man who has never stood under a skylight (applause), and yet he gives us directions as to how it should be done, and how to do it. Place that same man under the skylight and let him wait upon eighty people—all kinds of people, men, women and children—and let him do that for one day, and there would not be enough left of some of these writers to make a respectable funeral when night came. (Laughter.) I am glad I had a subject. I will try and stick to it, but I am afraid I will not.

I should be sorry to speak about any new developers. (Laughter.) I think there are 2,103 or 3,102 (laughter)—somewhere along there—and each one susceptible of two or three changes. I have some compassion on the brain of

amateurs. As I understand, the lunatic asylums, like the learned professions, are crowded. And then, again, I have been asked if I would not recommend before this audience somebody's plates (laughter); I am too much of a coward for that. There are too many good plates in the market, and I would not dare to recommend one man's plates, for fear I would never see any peace and comfort the remainder of my days from the rest of the makers. In short, I would rather not do it. As I say, I am too much of a coward for that.

I saw a pretty good Irish bull the other day. It seems that Pat came very near being killed, but by some dexterous movement he saved his life and got away. Some one said to him: "Pat, you are a coward." "Well," said Pat, "I had rather be a coward for ten minutes, than be a dead man all the rest of my life." And so it is in regard to the recommendation of any specific plates; for if I did, I would never see a minute's peace. (Laughter.)

But there is one thing I would say, and with all the nonsense I want to mix a little sense: Get a good reliable plate and get a good developer and go to work and master them. Then after you have mastered them, if you can find some changes that are going to be better, all right; but if you are going to follow each and every one's make and each and every one's suggestions, you will never make a worker. (Applause.) In the old days of the daguerreotype, we had one developer, and I think sometimes to-day it would be a good thing if we never had but one. There would not be half the changes and mistakes and half the plates spoiled that you see to-day.

I remember once a very singular thing. We used to have to go out and take sick people. We had a little developing box that I could carry under my arm, the camera and the whole thing, and the mercury for developing the picture, and a lamp to heat it, and the mercury after use we poured out from the corner here into a little bottle. I went one day and made some pictures of a sick lady, and when I came to pick up my things to go home, I found I had not put my mercury in the bath at all; but my pictures came out just as well. (Laughter.) That was a very singular circumstance to me, but I accounted for it very soon. There was enough mercury in the iron developing box to develop a picture, but I never made that mistake afterwards.

In the olden time the public had a very hazy conception of the process of making a picture. The people at that time knew no more about how the impression was made, and not so much as the most ignorant do to-day. And they think if the machine is good, a good picture is the result, and that is all they know about it. And in those times they talked in this way: One man would show his superior wisdom (he was telling the men who were around him): "You look in the machine and the picture comes, if you look long enough." (Laughter.) Another one says: "It is not so much the looking, but the sun burns it in when you look." Another one settles the whole thing by saying: "It is not so much the looking, but the plate itself is a looking-glass, and if you sit in front of it long enough your shadow sticks on the plate." (Laughter.) I have heard those very remarks made myself.

We had a great many pupils in those days and everybody who could not succeed in something else started to learn Daguerreotypy, and the first question the pupil would ask was "How long does it take?" I was forty-one years at it, and I never learned it all in that time; and they had an idea you only had to get your machine, try it a few times and you had learned it all. I used to tell them I could not tell how long it would take any man to learn it, as one would learn more in two days than another would in two weeks.

Mr. Weston, who was on the corner of Broadway and John Street, told me a very amusing story. A man, he said, came from a neighboring city to learn to make daguerreotypes, and after he came in the room and was told what the price would be and the cost of the camera and all that sort of thing, he said, Very well, he wanted to take instructions. He was going to stay in New York two weeks. Mr. Weston coated a plate, which was about the plan Professor Laudy has shown us here to night, and he said, "Is that all?" and Mr. Weston said, "Yes, that is all; that is what you do every time." And the man said, "I am not going

to pay board here in New York for two weeks for that ; why, I can do that myself." And so he straightway took his camera and other necessary appliances, and in about four days after that he came back with fire in his eye and walked in, holding the camera by the nozzle, and said: "There it is; it is not worth a damn." And Mr. Weston said, "What is the matter?" and he said, "It won't take a picture." And Weston coated a plate and put it in the camera, and brought out a picture at once. The man says, "I could not get it." "Of course you could not do it; you only saw me go through the motions two or three times, and you thought you knew it all." He said: "I set it in front of the window where I worked, and about a half a mile off there was a hill. Do you suppose that was the matter? Do you suppose that hill made the trouble?" (Laughter.) I mention this incident simply to show you what perfect ignorance there was in regard to it.

And then the name of the "daguerreotype"—as to spelling it—that was almost an impossibility. Some called them "doggertypes," some "daggertypes," some "degryotypes," and the vulgar "dogtypes." (Laughter.)

And the "dark room" was a place about which a great many people had a very curious and amusing idea. Some would ask, "What do you do in there?" One thought you went in there and did some hocus-pocus and some sleight of hand work to develop the picture; and another would say, "You need not be so particular to shut that door; I don't want to steal your trade." We were not so much afraid of the trade as we were of the tools, and in those days you did not see people bring a crowd of persons together to explain to them some new method of development, or a thing of that kind, as you do to-day. Every man that got an idea kept it to himself, and he would never let another photographer or daguerreotypist go into his dark room. Every man was the personification of all wisdom.

And then the improvements came so fast! What we learned one day, in two or three days was of no use, for something had been brought out in the meantime that was entirely new and superseded what we learned a day or two before. The advance has been very rapid in photography.

During my earlier days, in 1846, on a dark day I have often kept people sitting four minutes for a picture. Now, if some of you ladies and gentlemen will take out your watch and time four minutes and tell a man not to wink (laughter), you would see what a very difficult thing it was at that time; but the usual sittings were from thirty to forty seconds, and, finally, they were reduced down to ten or twelve; but I have been compelled to take four minutes many a time on a dark day.

Now, as to the daguerreotype, I want to mention one fact which is not commonly known. The daguerreotype will not fade, and I know what I am talking about when I make that assertion. While it will not fade, it may become tarnished on the surface, but that can be easily cleaned. I have cleaned a great many of them and made them just as perfect as they were the day they were taken, provided some person has not taken a handkerchief and rubbed it out. I remember a case: Only a few years ago a lady came to me with a half-sized picture, and you could not see anything at all upon it. She wanted to know if I could clean it; and I took it and cleaned it, and in about five minutes I brought it to her and showed it to her and she fainted dead away in a moment. It was her husband, who had been dead twenty years, and she had not seen the picture in fifteen years. It was so completely covered with a film that there was nothing to be seen, and I brought it up as good as it was originally. As I say, the lady fainted immediately. It was just as if her husband had been brought back from the grave for her to see.

The earliest photographic literature that I remember was "Humphrey's Journal," and a journal—I think called "The Photographic and Fine Art Journal"—by Mr. H. H. Snelling. If there were earlier ones, I do not remember them. I have several of the pictures by which they were illustrated after they commenced making photographs, but they are pretty poor things compared to what we make nowadays. Still, at that time, they were considered wonder-

ful. I well remember the first paper picture I ever saw, and the first little *carte de visite* that I ever saw—a friend of mine brought it from Paris. It was a full length picture of a man standing by a fluted column, and his head was a little larger than the head of a pin (laughter). I laughed when I saw it, and thought it was a very curious little thing; but, however, it was not long before I was making them at the rate of a hundred to a hundred and twenty-five dozen a day.

I have some of the old photographic publications, and I want to state to you, gentlemen, that this dry plate you are using to-day is the work of care and experience and experimenting almost beyond our reasonable conception. Men have worked with mind and brain for half a century to bring the art of photography to its present status, and they know of the difficulties that were encountered before its success was ultimately obtained, and they can better appreciate its worth than the novice of to-day who finds his apparatus quickly and easily adjusted, his plates and developers all prepared, with printed directions how to use them. In this respect, photography is far different at the present day from what it was in former times. The dry plate, now so universally used, has required an amount of time and labor, discussion and money upon its preparation that one would hardly believe. In its early stages it was thought that it would be desirable for out-door photography, but the long exposure that was necessary—nearly three times longer than the wet plate—made it doubtful whether it ever would be available.

(*To be continued.*)

THE DISCOVERY OF THE DAGUERRETYPE PROCESS.

BY L. H. LAUDY, PH.D.

[Read before the Society of Amateur Photographers of New York, January 31, 1889.]

Ladies and Gentlemen: I am conscious of my own unfitness for the honor you have conferred upon me on this important occasion, knowing of others that have a superior claim for this distinction, those that have given the subject more careful study and would be better qualified to address you this evening, and it is to be hoped that we may hear from them on this subject.

I am sensible of the greatness of the field, and that others may have an opportunity to address you, my remarks must necessarily be slight and imperfect.

I hope you will understand my position, and I will trust to you for an equitable consideration.

Mankind little reflects what a privilege we enjoy living in this nineteenth century, for included in it are all the great discoveries. Truly, this is the age of progress and invention. We are better prepared to-day to accept the announcement of any great discovery, and to look upon it with less incredulity, to encourage and possibly capitalize it, than were the people when the announcement was made of actually impressing the image so often seen in the camera obscura, and producing in all its detail the reflected image and making a permanent impression upon a sensitive surface.

This paved the way for other discoveries, and to-day we have many important inventions that contribute to our welfare and happiness.

We have the best and cheapest farm implements, fire engines, fire-arms, fastest steamers and best railroads, telegraph, photography, anæsthesia, sewing machine, electric light, telephone, phonograph, and last, flexible films. If any nation during the same time has done more, or as much, the fact is not generally known.

We are assembled here to-night to celebrate the fiftieth year of one of these many inventions, the greatest of all discoveries—photography—and to pay homage to the illustrious names of Niepce, Daguerre and Talbot, not forgetting our own countryman, Dr. Draper. The name of each is associated with that which he accomplished—names that will forever shine forth as fixed planets in the shrine of invention. They will be everlasting on the tablets of memory,

monuments in themselves, the best that can be erected to everlasting fame, and will never cease to be heralded to all the world.

We need not write the history of these great men ; it is too well known, for their noble gifts to science will ever share the same position that follows with their fame, and to-day we reap the golden harvest of their genius and invention.

You may wonder why I have added the name of Dr. Draper to the list. My reason in so doing is because Daguerre never succeeded in taking likenesses ; when the French government purchased his process, it was only adapted to statuary and architecture. The first successful daguerreotype portraits were made in the New York University, 1840, by Dr. Draper, who overcame the optical difficulty which had defeated all the previous attempts. When the news of the discovery reached Europe, it was ascribed to the peculiar brilliancy of the American sun ; but this theory was hard to reconcile with the success which attended the American artists who soon prosecuted the business in London and Paris.

Opinions may differ as to the real date of this important celebration ; whether it should be chosen from the date of the discovery or the public announcement before the Chamber of Deputies by M. Arago, are matters of minor importance.

Each progressive step in photography is worthy of special recognition, and it is to be hoped that steps will be taken to celebrate the occasion of that important date upon which M. Arago read the paper before the French Academy of Science.

The ultimate movement in all cases establishes the fact that this is the most wonderful invention of the nineteenth century, and it reflects great credit upon the society in taking the initial steps to make this year one of celebration and commemoration to these great discoveries.

On January 31, 1839, the results of Daguerre's labors came forth fully finished for use.

To France alone, for the daguerreotype, is all honor due, and the liberality with which it was purchased and given for the benefit of universal science will secure to France the gratitude of all nations.

This wise and generous step was at the suggestion of her most eminent philosopher, M. Arago, to whom Daguerre had confided the secret of his art.

Struck with the splendor of the discovery and foreseeing the advantages which science and art would receive from its application, he induced the French government to offer an unusual pension of 6,000 francs to Daguerre, and to Niepce a pension of 4,000 francs, for surrendering to the public the use of their inventions.

When the secret was made known and the pensions granted, the seals which retained the secret were broken and the daguerreotype became the property of the world.

The genius of men like this comes like an incantation of science and descends upon the world but once in a series of years, and the peculiar assemblage of faculties requisite to produce these wonderful results are seldom found together, each possessing that persistent will, and all claiming to share in the great discovery ; some giving the result of their labors to science, others pensioned by a government, and to one must be added the desire for a patent granted by the English laws.

This does not detract from their fame. They have accomplished enough to crown them all founders of our beautiful art.

And while the invention has afforded employment to thousands, it may be safely said that it has given to art the greatest stimulus it has received in modern times.

The colors of genius are determined by the ray incident on the first prism and the light once decomposed by refraction no further refraction can again decompose. It is thus with photography ; for to-day it remains the same incident ray (the camera lens and silver salts are in principle the same that were used by the early investigators), and no further change has taken place, and it is doubtful if any ever will.

Many topics are important enough to deserve a separate consideration. All that can be alluded to in this short space of time will be to point out objects best deserving our attention; while, if time permitted, we could present a diorama of men all more or less connected with this history. To mention a few of the many may not be out of place—Niepce, Daguerre, Talbot, Draper, Fyfe, Claudet, Fizeau, Biot, Arago, Hunt, Ponton, Lassargne, Netus, Herschel, Moser and Lerebours.

Horace, Vernet and Goupil made daguerreotypes in Spain; Fredrichstal traveled in Central America for the Prussian Government; Davidson made first camera (optician of Edinburgh); Adamson first made pictures in New York.

If time were at my disposal, I should like to inquire into the various benefits that result from photography, and to show that it has had as great an effect upon civilization as the telegraph, telephone and steam engine.

It stands alone, occupying a distinct position and furnishing to mankind a new vision that can penetrate into distance or the past, a retina as faithful as the human eye, but whose impressions do not perish with the wave of light that gave them birth. It has had a birth and a growth among the people; it has, like many other discoveries, been singularly successful in interpreting the wants of the day and serving popular welfare.

The noble works of the great masters are no longer the exclusive property of a single individual; they are now reproduced by the aid of photography and given to the world or published for the benefit of society.

The whole world is brought to our view by the aid of photography, and to-day we find it occupying an important position in science, art and all industries.

To me it has always been a pleasure to look over the history of these great men, and to ramble through the literature of the important event has offered many pleasant hours of study.

To-night I yield the field to others, for my mission is rather to describe the process than to describe the men.

I am inclined to think that I shall best meet your wishes if, instead of dwelling on the history of these great men, we include them all in one great class of inventors and benefactors to mankind, and in as brief a manner as possible outline the daguerreotype process and describe the use of the apparatus that has been loaned from the photographic collection of the School of Mines Museum.

The daguerreotype process is wonderful for its extreme simplicity, and when once explained it seems strange that it was not thought of before. The crowning wonder of all is that it was made at a time when materials were not only difficult to procure, but far from being pure.

Iodine was discovered in 1812 by Courtois, and bromine by Ballard in 1826.

Little did they dream that their discoveries would lay the foundation of the science of photography, and it is surprising to think that no other compounds have ever been used with success, and it is not likely that others will.

[Professor Laudy here went through the operation of buffing a silvered plate; then illustrated the use of the iodine sensitizing box and the funnel-shaped mercury developing bath. He also showed several old specimens of daguerreotypes and Talbotypes.]

FIFTEEN YEARS' EXPERIENCE OF A DAGUERREOTYPYER.

BY ALEXANDER BECKERS.

[Read before the Society of Amateur Photographers of New York, January 31, 1889.]

IN response to the request of your Corresponding Secretary, Mr. Duffield, I hereby give an outline of my experience in the history of the daguerreotype, for a period of fifteen years.

The details of this antiquated, senior branch of your art can interest you only in such parts as are similar. A comparison of the two, however, will show the progress of the half century we commemorate to-day, as also the centennial of the birth of Daguerre.

The first daguerreotype I saw, was made by Robert Cornelius, in Philadelphia. His laboratory was conspicuous. On the outside could be seen a large mirror, swung on a bracket, for illuminating his sitters with reflected sunlight. The use of bromine was not yet known in 1840, but Boudine introduced it soon after. In the same year Robert Chilton called on my brother to make hyposulphite of soda, offering four and a half dollars per pound, stating that the French article cost over five dollars to import, although still impure. Thus the first hypo was made here at the corner of 23d street and Fourth avenue, the present site of the Young Men's Christian Association. Orders for other chemicals followed, and in 1843 Louis Beckers was the first to manufacture photographic chemicals exclusively, at Old York Road, Philadelphia.

In the same year I entered the daguerreotype business of Mr. Fred Langenheim, in the Merchants' Exchange of Philadelphia. Here there was little to be seen of the things you see nowadays in a photographic art gallery. A kind of a hiding-place for a dark room, and a spyglass-like camera were all the indications of the mystery I was to learn. The camera rested on a candlestick-like tripod, with three set-screws for adjustment, and was placed on an ordinary table. To interchange the ground glass and round daguerreotype plate, it was necessary to unscrew a flanged ring, and replace the same by a reverse motion. For the adjustment of the focus, there was the rack and pinion, as Voightlander's instruments still have. This instrument was one of the first made according to the mathematical calculations of Professor Petzval, of Vienna, having two achromatic lenses. It had been sent by young Voightlander to his college-mate, William Langenheim, as a present, with supplies and instructions, but also the warning not to try daguerreotyping, unless he had courage enough to try five hundred times more after failing with the first hundred pictures. William Langenheim, a lawyer, did not have the courage, but his brother Fred had, and succeeded so well that he was offered six hundred dollars for that odd camera.

The manipulations of preparing a daguerreotype plate will not interest you much. I should state, however, that the production of a chemically clean surface on silver, is a difficulty that increases four-fold with the size of the plate. Another difficulty is the use of the chemicals in a volatile state. The iodine can be controlled by sight with faint day-light, but the bromine only by even temperature and constant practice.

At Langenheim's necessity soon introduced a square camera, with square plates and holders. A high tripod was also used instead of the table. In the summer of 1843 the first dozen of small Voightlander objectives, such as are still on the market, were imported. Soon after, four larger ones, for 6 x 8-inch pictures, arrived. In the fall of that year, Phillip Hass, formerly of Paris, showed Fizeau's method of fixing the image on the plate by cold gilding. Soon after the picture was made more brilliant by heating the plate while the gold solution was on it. In that winter the first polishing wheel was made. It was constructed like an ordinary grindstone, worked by a treadle, the wheel being cushioned and covered with buckskin. With the aid of this machine, and after weeks of hard labor and many experiments, we succeeded in making the first good large daguerreotype of 6 x 8 inches, called whole size; half and two-thirds size were advertised and made with success. At that time we also succeeded in making a picture of a sick lady at her own residence, which had been considered impossible.

In the spring of 1844 Mr. Edward White bought one of the large Voightlander instruments, and for him I made the first large daguerreotypes in this city at 175 Broadway. There were then but a few daguerreans here. They were I. Gurney, Anthony, Edwards & Chilton, Augustus Morand, Van Loan, Burgess, Brush, Weston, Artho, Insley, Plumb, and others I cannot recall.

I remained with Edward White until December, 1844, when it became impossible to make a picture in his operating room on account of the extreme cold, for Mr. White would not allow a fire in the place over night. Then I commenced business for myself, at the corner of Nassau and John streets, and after May, 1845, at 201 Broadway, under the firm of Langenheim & Beckers, agents for Voightlander & Louis Beckers.

At that time the large Voightlander objectives had a chemical and a visual focus, so that in order to make a large, near picture, the lenses were moved out one-eighth of an inch, while for usual work the ground glass was set permanently one-sixteenth of an inch nearer than the plate. That summer I took a view of High Bridge before the scaffolding was removed. This picture was taken for the engineers, and was perhaps the first one ever taken here in aid of architecture. By taking out-door views I discovered that the plates increased in sensitiveness with the time between the preparation and exposure, and in 1848 obtained a sharp picture of a procession in motion.

In 1847 I began to use a speculum metal mirror, in order to have my pictures not inverted. For very unsymmetrical faces this arrangement was quite indispensable in order to get a likeness. The mirror was attached to the instrument at an angle of 45 degrees. The use of the mirror required double the time of exposure. It was made by Fitz, Senior, the optician, and was used for years after.

In 1848 Fred Langenheim bought the Fox-Talbot patent for the United States, at six thousand dollars. He introduced it here and failed in the undertaking. Our daguerreotypes were taken so perfect that they were preferred to any Talbotype. Abroad the superiority of our pictures was attributed to our clear atmosphere until American Daguerreotypists, as Dentists, took the lead all over the world.

In 1849 my firm was changed to Beckers & Piard. Having now more time, we succeeded in substituting machinery for cleaning our plates, and thus obtained cleaner and better plates in one-third the time required by hand.

In 1852 M. M. Root, of Philadelphia, made two pictures on one plate. We succeeded in making four on one plate, and in such a way that the exposed quarter was in the center of the field of the lens. It was then a great relief, as locket pictures were in fashion. In 1856 Mr. Ormsbee patented this same multiplying plate holder and collected considerable money on it, until my priority made his claim void.

The production of stereoscopic portraits was the next task. Marchner, of Philadelphia, made patent cases to show these pictures in a very neat way. In 1854 F. Langenheim had commenced to manufacture stereoscopic views on glass. He sent me three dozen of his make, to find sale for them here. At the first exhibit of these pictures one dozen of them were broken. This loss set me to thinking how to find an arrangement to show and secure the pictures against breakage, and in 1857 I obtained a patent for my revolving stereoscope. The increasing demand for this machine induced me to sell my daguerreotype business in 1858.

Thus I was relieved from satisfying the vanity of each individual beauty of this world, and ended my career as a daguerrean.

EARLY DAYS OF AMATEUR PHOTOGRAPHY

BY HENRY J. NEWTON.

[Read before the Society of Amateur Photographers of New York, January 31, 1889.]

IN speaking about amateur photographers in the early days of this art-science, it would be a convenient thing if I could give you a generally accepted definition of the word "Amateur Photographer." At the first meeting held for the purpose of organizing this society, this question was discussed and certain conclusions arrived at, but no authorized definition has been incorporated in the Constitution or By-Laws of this society. I am of the opinion that it should be done by every amateur society as a safeguard and protection from dangers which are liable to beset such an organization when in the hands of incompetent, dishonest or designing persons. In the use of the word "amateur" to-night I shall mean a person who works in or experiments in photography from other reasons than the pecuniary benefit which it will be to him.

On the 10th of August, 1839, the secrets of Daguerre and Niepce were given to the world through the French government, who, through the influence of

Arago, had purchased the secrets at the price of a life pension of 6,000 francs a year to Daguerre and 4,000 francs to Niepce.

In less than a year from the above-mentioned date, Paris was swarming with amateur photographers.

At the windows and on the balconies of the houses could be seen the little instruments adjusted with the sensitive plate waiting for the light to impress an image of some favorite object in its silent and mysterious way.

The city of Paris was thoroughly excited over the wonderful discoveries of their townsman and Niepce. The subject was on every tongue. Friends and neighbors on meeting could talk of nothing else. For a month or two the fever ran riot with business and reason; but in this short time it became an old story; the curiosity and wonder had ceased, because they had become common and familiar; so this first flourishing and prolific crop of amateurs soon passed away, and their silence became as conspicuous as had been their noise.

The fever had subsided without the administration of any drugs. Nature seemed to perfectly understand the excitable character of the French people. In Europe and this country scientists, especially chemists, became deeply interested and studied it from a scientific point of view. Professor John W. Draper, of this city, soon became an expert in making daguerreotypes, and claims to have been the first person to make a picture of the human face, and that was the face of his wife. The last time I saw this picture was when Dr. Draper showed it to the members of the American Photographical Society, of which he was President. This was not a society for amateurs exclusively, but professionals as well. This society was organized somewhere, I think, in 1858 or 1859. In 1861 Mr. H. T. Anthony organized the "Amateur Photographic Exchange Club." At this time amateur photographers were few, and to be one meant something very different from what it does to-day.

To succeed then meant hard work and study. You were required to know how to make almost everything connected with the production of a photographic print. You must know how to make collodion; how to coat a plate and how to sensitize and develop it; how to construct the silver bath in which the plate was sensitized; how to make the developer; how to clean the plate; how to prepare the nitrate of silver bath for sensitizing the albumen paper; to fume, print, tone and fix the prints; how to make paste, and how to mount the prints. The amateur of those times was further required to make himself familiar with the chemistry involved in all this work: first, in order that what he did he might do intelligently and successfully; and, second, to be qualified to determine with a degree of certainty what was the matter when his chemicals gave unsatisfactory results.

The negative bath was one of his most treacherous friends; he could not predict, with any degree of certainty, what would happen to the next plate by the result on the one immediately preceding it. There seemed to be a demon lurking in the dark room, watching for an opportunity to get you into trouble, and, as the negative bath was the most sensitive, he would take advantage of this weak point, and if he had got into it bodily with all the sulphur and cinders he is supposed to have adhering to his external person, and stirred it up vigorously with his fabulous pitchfork covered with lava from the pit, it could not have made the bath worse than it would sometimes get in an incredibly short time; and this would always happen at the worst possible moment. If you had invited some *particular friend* to have his picture made, some one to whom you wanted to show what you could do, and what beautiful negatives you could make, how expert you had become, then this demon delighted to get into the bath and muddle it, so that, do the best you could, nothing but fog, fog would be the result. The amateurs of those times wished frequently that Job had lived in their day and had become an amateur photographer; they did not believe he would think a few boils of any account, or if he did he would not have taken the first premium in a competition for patience.

It was such vexatious trials which kept the ranks of amateurs thin, and when one happened to be exposed and took the fever he would get over it in a year or

two, and so complete would be the cure that you would never suspect that anything had been the matter. There were a few exceptions to this rule, which was when the trouble became chronic. I could point to a few examples of persons so affected—your speaker was one of that class. To him there is a fascination and a satisfaction in experimenting.

The development of an exposed plate brings one into close and intimate relation with nature. You are admitted into one of her interior sanctuaries, while she places in your hand one of her magical wands, and while you look at the white plate before you, lo! a form begins to come forth like a spectre from its winding sheet, and apparently it throws off fold after fold of its snowy environments until it stands revealed in perfection and beauty. What can there be more wonderful than this? With the market supplied with ready-made plates of great variety, so that the most fastidious can be suited, the path of the amateur has become one of comparative ease and pleasantness, and the result has been a great increase in numbers and amateur societies. There is every prospect that this state of things will not only continue, but greatly increase. Photography is one of the three great discoveries of this century—the steam engine, the electric telegraph and photography.

In looking back through the past centuries where can there be found three great discoveries so near to each other?

There are no five centuries that can show anything like the gigantic strides in discoveries, knowledge and general advancement of the human family, of this one present century. It seems the blossoming time of all the past. These discoveries seem to be the offspring which nature gives us as the fruit of centuries of travail and pain. Copernicus, Galileo, Kepler and Newton were voices in the wilderness preparing the way for the dawning light of the present time. It is but a prophecy of what will be revealed in the future.

The barriers that heretofore have hindered the car of progress are being forced to give way. We, to-day, are only witnessing the first faint ripples of the incoming tide. If we contrast the present civilization with the time when men lived in caves and holes of the earth with wild animals, it will be found difficult to realize that the present can be the product of such a past. The way from savagery to civilization has been a longer and more terrible one than we can well conceive of. Only a fraction of the human family can be called civilized; generations upon generations will come and go, leaving scarcely a sign of advance among the semi-civilized and barbarous nations for long ages to come.

Progress in the future will no doubt travel with accelerated speed. The light and energy at the disposal of the nations in the lead at the present time are being felt as a potential force in every part of the globe.

STAINED COLLODION.

A. M. DE SILVA.

READING recently an article by Dr. Eder on the Staining of Collodion and Collodion Emulsion Films, brought to my mind an old-time experience which might be of service to those about to try this method. In 1874, having a number of interior views to make, I tried the effect of staining the collodion. My experience was that the dye washed out of the collodion, coloring the bath solution, which very soon gave out, and I could obtain nothing but foggy plates; besides, I was unable to keep my plates for any great length of time, at least not nearly so long as without using the stained films. Another thing, I never could doctor up the baths so that they would work sufficiently well to please me. If I remember rightly, I was pleased with the results, and gave up the use of the stained collodion simply because, with everything in good order, I could keep my plates for a very long time (some of the exposures being as long as two and a quarter hours) and obtain equally as good results, so that any advantage gained

was more than counterbalanced by the uncertainty of the keeping of the films, the rapidity with which the silver solutions were put out of order and the difficulty of getting them right. I do not intend to dissuade any one from trying the staining of their films, but merely as a word of caution, advising them to try the experiment by all means, but with a small quantity of silver bath (new bath preferably), and not risk their regular working solutions.

The above note was received some time since and its publication has been delayed because it was lost. Now that we have found it we think that it should be well considered at the present time when ortho-chromatic work is the order of the day.—Eds.

OUR ILLUSTRATION.

THE portrait of the talented little actress with which we illustrate this issue of the BULLETIN is from the studio of Mr. George G. Rockwood of New York. The Mary Anderson Company contains many excellent actresses, but there are none among them that are so young as the subject of our frontispiece and so full of promise. The picture is characteristic and one of Mr. Rockwood's best efforts. The story of Mamillus is a sad one, and the expression on the face of Miss Hoare is wonderfully in keeping with the events of his short and unhappy career.

OBITUARY NOTES.

WE regret to have to record the death of M. Henri Boissonnas, the well known photographic merchant, of Geneva, Switzerland, who passed away on January 26th last, in the fifty-sixth year of his age. M. Boissonnas was a man of much business ability, and had a progressive spirit in all things pertaining to photography. We tender our sympathy to his bereaved family and associates.

WE also regret to record the death of William Weightman, Jr., M.D., the junior partner of the world-renowned firm of chemical manufacturers, Messrs. Powers & Weightman, of Philadelphia. He passed away on February 11th, in the forty-third year of his age. His associates are assured of our sincere sympathy.

CANNOT keep house without it.

JOHN ESMAY.

THE Annual received. I am very much pleased with it.

S. J. CHASE.

I do not know how I could get along without the BULLETIN.

WM. L. PRICE.

I TAKE several photographic papers and the BULLETIN holds its own, at least to my notion.

O. A. MARKEY.

WHILE so many sound its praises, it is only necessary for me to say that it is exceedingly valuable to me, and I would not be without it.

GEORGE N. MOORE.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

AMATEUR PHOTOGRAPHIC SOCIETY OF BALTIMORE.

REGULAR MEETING, FRIDAY, FEBRUARY
15, 1889.

President ISAAC T. NORRIS in the chair and twenty-one members present. After the usual routine business a lot of flash-light pictures were shown by Messrs. Williar and Quartley; views taken in the late Charcoal Club exhibition of paintings, draperies, vases, etc.; also some excellent prints by Messrs. Williar, Onderdonk, Binns and Gresham.

Some of our members having in view the coming lantern slide exhibition have been working hard to get some nice slides, and judging from those exhibited at the meeting above referred to, I am quite sure that we are going to have the best entertainment that the club has yet enjoyed since its inception.

In order to experiment on these slides some of our members have clubbed together and bought a fine oil lantern for the use of the society, and we shall now have every opportunity to test our slides thoroughly before presenting them to the public at an exhibition. The all-

absorbing topic now is, as to who will be lucky ones in the contests that the society have offered four prizes for, and of which I have previously advised you, viz., four handsome gold medals for the best two instantaneous and the best lantern slides. The fourth prize goes to the ladies; and judging from the work of the ladies that I have seen, I am quite sure that had the prizes been left open to the ladies to compete in all, they would have been second to none, as witness most excellent results both in time and instantaneous work; and more especially are they deserving of notice owing to the extreme care taken in their composition, which is certainly first class in every respect. After some discussion on various topics of interest to the amateurs, Mr. Daniel Miller had his lantern set up and showed the members a fine collection of professional slides, and later a lot of slides of his own production, as also some of Messrs. Williar, Binns, Gresham, Trimble and others, after which a vote of thanks was tendered to Mr. Miller for his kindness in showing the slides and for the use of his lantern. Meeting adjourned.

HARRY D. WILLIAR,

Secretary.

LOWELL CAMERA CLUB.

THE first regular meeting of the club was held at Morrill's studio, February 19th. The club organization had been completed at the special meeting called a month previous, but the enrollment of members was left until the Constitution and By-Laws then adopted could be copied into the club register. The membership now numbers thirty-two, including several ladies.

The first business before the club was to take action upon a place of meeting. Two photographers have proffered to the club the use of their reception rooms for a place of meeting. It was announced by a member that a room in Mechanics' Hall building might be secured at a reasonable price. As there was some difference of opinion, the matter was recommitted to Committee on Rooms to make further inquiry and report at next meeting.

A communication from the Providence Camera Club regarding the formation of a New England lantern slide exchange was next considered. A committee consisting of J. D. Gould and G. A. Nelson was appointed to confer with members, and, if it was thought practicable, to report in favor of joining the exchange if one should be formed.

The club library at present consists of half a dozen of the best photographic magazines,

the annuals, and the latest and best books on photography. It was voted to keep the library at the photographic rooms of A. H. Sanborn & Co., Central Block, until a permanent headquarters could be secured.

The subject for the evening was "The Flash-light." Mr. H. W. Barnes read a very interesting and instructive paper, explaining the development of the idea of using magnesium as an artificial light for use in photography. He illustrated each step by burning the magnesium wire, the powder with gun-cotton, compounds of various kinds, and lastly the magnesium lamp.

Mr. J. D. Gould showed and explained his new apparatus for burning magnesium powder in large quantities. With this lamp four (4) grams of the powder may be burned at one flash, which affords sufficient light to take large group pictures with good results.

Several cameras were focused upon the company, and it was expected good pictures would be secured, but owing to the bursting of the large rubber bag used as a reservoir for compressed air for blowing the powder, the results were not quite satisfactory.

The negatives obtained, however, indicate that without accident well lighted pictures of large groups may be secured by the use of this lamp.

A vote of thanks to Mr. Barnes for his valuable paper was unanimously passed; also to Mr. Morrill for the use of his reception room.

Adjourned. GEORGE A. NELSON,

Secretary.

CASE SCHOOL CAMERA CLUB (CLEVELAND).

THE demonstration of the Willis & Clements process of producing sepia platinotype prints, which was given this afternoon (Friday, 22d) by Mr. Fred A. Coleman before the club, was all that could be wished for. The prints came out in fine style, and were the admiration of all present. In the absence of *President* Hall, *Hon. Vice-President* Smith occupied the chair. Mr. Kent Jarvis was elected a member. Subject for next meeting not announced.

MILTON B. PUNNETT,

Corresponding Secretary.

NEW BRUNSWICK CAMERADS.

REGULAR MEETING, FEBRUARY 21, 1889.

PROFESSOR AUSTIN, the *President*, drew attention to a number of recent interesting matters in photographic science. Experiences with hydroquinone were given, and all were

favorable. Dr. Tredell spoke of the different methods of compounding the hydroquinone developer. Forty lantern slides were shown. Those prepared by the wet plate process were particularly clear and sharp. A new electric lamp was tried with the slides, but did not give a perfectly even illumination. Adjourned.

HARVEY TREDELL,

Secretary.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, JANUARY 8, 1889.

(Continued.)

TAKING a plate of a sensitometer 25, and using F-8, as Dr. Piffard states, which I believe is the proper aperture to use at all times, one ought to gauge the plate by the light they have to use. Sometimes, in extreme hot weather, a Carbutt B plate I have used for instantaneous pictures. By using stop F-8 you get atmosphere in your picture. The main object, or the thing you take, will be in focus, and the background, as it appears to the eye, in diffused focus, which is more correct. A good many people say that by using a small stop we get everything on the different planes in focus, so that the foreground, the middle distance and extreme distance will be sharp. But the flatness is something terrible.

Now, in the matter of the development of these plates: if you take a slow plate, using any developer you please, it is easy. This plate which you are using we will suppose contains a good deal of silver; you get an impression on that silver, you have got silver back of it, you reduce it with your developer and you get a good, vigorous image. With a rapid plate (a good many of them) there is not silver enough in them. This is done in getting the speed in the plate, and in order to get speed they leave a portion of the silver out, and you have to make it up in the development. A plate of the sensitometer of 25, any average person can develop; but when you get up to 27 degrees Warnerke, or beyond, or up to 50 degrees, or what Cramer calls his "greased lightning plates" of 70 degrees sensitometer, then it is not so much fun. You make instantaneous exposures, and you want instantaneous development, but you do not get it. You go into your dark room, sit down or stand up, just as is the more convenient, and put on your developer. Your formula says so much of this and so much of that, some say weak and some strong. You put it on

and it comes out weak and thin, and unsatisfactory. You look at it and proceed to fix it. It is thin, and you cannot see any detail, and say: "That is undertimed; that lens is not good." You go and get another lens, and you try it, but with no better success. Then, after a while, perhaps, the plate gets into the hands of somebody who has had considerable experience, and he looks at it and says, "It has a lack of detail in it." And the books say, if there is a lack of detail, the plate is undertimed; but it is just the opposite in extremely rapid plates. Taking Cramer's sensitometer numbers of a winter-made plate, of sensitometer 35, you will find that there is silver enough in the plate to be developed, and you get full time, providing you use an aperture of $f/8$, regulating the speed of the shutter to get the correct time.

The developer should not be put on weak, although a good many formulas read that way.

To develop instantaneous exposures instantaneously, the developer should be put on strong, soaking first in pyro, if you use pyro; but if you use hydroquinone you had better use it in two solutions, soaking first in the hydroquinone, and using the method of separate solutions for the development.

If you take a plate of a sensitometer of 50, which we will say is about as fast as the average person can develop in the average light that is used to develop in, the developer should be put on the plate extremely strong. The development should be concluded in about five minutes.

At the point where most people would stop development is just the point where they should proceed. After the plate begins to kind of fog over, don't pay any attention to it, but pour that developer off and throw it away. It has spent itself. Whatever pyro or hydroquinone there may have been, it has had a tanning effect on the film, and it prevents any alkali you may add from penetrating into the plate and doing its work. You take the plate out of the developer and throw the developer away and rinse the plate off with water and place it in a pan, while you prepare some fresh alkali solution, and flow the plate, until you see the plate gain density, and carry it along until it begins to gray over well, then put it into your hypo bath, containing a little alum. The alum will prevent its being stained, and also acts as a kind of reducer, cleaning out the shadows, and you have a clear, dense negative on an extremely rapid plate.

Now, in my practice, I use a pyro developer.

I make it in three solutions, mixed by hydrometer. The sulphate solution tests 60 degrees by hydrometer, being in one solution, in a glass stopper bottle. The alkali solution is carbonate of soda and water, and the test is 20 degrees. The pyro is mixed with distilled water; but whether you use distilled water or not, is immaterial; acidify with oxalic acid, and pour in 12 ounces of water, and into that 1 ounce of pyro. You will find that the pyro will keep dissolved in the water, either in the light or away from it.

Now, in using this developer, you take a sufficient quantity of the sulphite solution and cover your plate, and to that you add from 2 to 3 drams of pyro solution and from 2 to 3 drams of carbonate solution, and no water whatever. You will find this is a very powerful developer and especially adapted for the Cramer plates. If you use it on a Carbutt plate it should be diluted one-half and less pyro used. A convenient method of using it is to first soak the plate in pyro and sulphite solution alone for a minute, then place it in the alkali and watch the effect. If it is over-exposed, apply the bromide of potassium and check it at once. Do not be afraid of it, but put it on in good quantities. Then soak the plate in pyro and sulphite solution for a minute, and to this gradually add the original developer, drop by drop; by this method a good negative will be secured from an over-exposed plate. As to the correct timing of rapid plates: it is more the amount of light which strikes the plate at the moment than any subsequent light which comes after. Now, a number have used a good many rapid plates in taking flash-light pictures; for instance, they would expose on an interior and would make one flash, and then another, and then another, and another, and then they would go to work and develop it and the plate would come up and fog all over, having the appearance of being undertimed, and they would wonder what the matter was. The reason of this is, the first light affects the plate, and every succeeding shot after that has to go through the silver which has been reduced by the light, and the successive flashes after the first do not hurt the plate at all. It is the first light you get on the plate that does the work; and this is one of the secrets of success in instantaneous work with detective cameras, by using lenses of large aperture and getting plenty of light to do the work the first time. If you stop down, you will get very little light on the plate and you will get extreme flatness, which is not wanted.

In developing instantaneous exposures with hydroquinone a weak developer is preferable. A very good plan is to start the plate in weak pyro until you get the details and then finish the plate by a separate solution development in hydroquinone developer, which will give you good density, softness and delicacy, where, with hydroquinone alone on an instantaneous exposed plate, you are apt to get extreme hardness or rockiness.

The *President*—The question of different printing processes is of course always uppermost in the amateur's mind; and while to a good many of the members and gentlemen present here the platinotype process is probably familiar, still there may be some of those who have recently taken up photography, or recent members of the society, who don't know very much about the process. We have arranged for a partial demonstration of the process here to-night—not that of coating the paper or of exposure, but showing the development and the ease with which it can be done.

The sensitized paper, where it is bought ready prepared, or prepared by one's self, is exposed in a printing frame in the usual way. Mr. Duffield has, I believe, some of the prints after exposure, just as they are taken out of the frame, and you will see that the image is hardly visible. The paper has a somewhat yellowish tone. It is analogous to that which is familiar in the case of the blue print paper, and in that connection it is well to note that the sometimes despised blue print is a relative of the platinotype. In the current number of the *British Journal of Photography Almanac* for 1889, a copy of which is on the table, Mr. Traill Taylor has quite an extensive article on the different printing processes of which iron plays an important part, and he treats of the blue print process and the platinotype process. The paper is of a lemon-yellow color before exposure, and it prints as you can see by the samples. Of course they must be protected from unnecessary light, and as much as may be from moisture until development. The development is properly conducted in a feeble white light, and it can be proceeded with immediately after the print has been exposed, or the development can be delayed, which is sometimes a desideratum. The developer is a solution of neutral oxalate of potash in water, but heated within certain limits of temperature, about blood heat. The water ought to be about as hot as you can easily bear the finger in it. The development is made by laying an exposed print on the surface of the hot water,

carefully avoiding air bubbles, and allowing it to remain there until development has proceeded far enough, which you will find out by looking at it, and then rinsing in water, and fixing it with hydrochloric acid, which clears and washes the print. Now you can see those things very much easier than you can comprehend it by hearing any one speak about it.

Mr. ATKINSON—Has not the cold process of printing out superseded that altogether?

The *President*—It is a good deal of a question whether it has or not. It is the latest wrinkle, and it is certainly very much more convenient; but all the samples I have seen have been, in some respects, a little less desirable.

Mr. ATKINSON—There is one point that I want to call attention to, and that is, in using cold water I don't think you get a desirable result; but if the paper is steamed over some boiling water, thereby softening the film, you get a much better result.

The *President*—I have heard that suggested, but at the same time my personal knowledge of it is, that with all the samples I have seen of the printing-out process, there has been something wanting as compared with the usual process with a hot oxalate solution.

Dr. FULLER—My experience has been that it was a bad plan to use a hot solution. It is better to use a solution of a lower temperature, and you can return the print to the solution two or three times until you have the required degree of development.

The *President*—At the suggestion of Mr. Williams, I made application on behalf of the society for space at the Paris Universal Exhibition of 1889. I have to-night received a notification of the allotment of space for the society, and it is 9x13 feet—not a very large space—but we see it will require some little care and selection on our part to fill it worthily. Mr. Williams has kindly consented to act as chairman of the committee for taking charge of the exhibits of the society. He hopes to be present at the exhibition himself during a large portion of it to see that the society is well taken care of. The others of the committee have not yet been named, but they will be announced, and of course the members will be notified of what is necessarily expected of them in connection with it.

The programme that has been sent out contains a notice of a special lantern slide exhibition on January 18th. The regular lantern slide exhibition will be on January 25th, and a special meeting on Thursday, January 31st, in

commemoration of the birth of photography. That, I think, will be a very interesting occasion, and I hope we will all take pains to be present. In connection with the special meeting of the 18th, I would say that there will be shown about forty slides—views of open air statuary in and around New York—being a collection of the public monuments and statues ornamenting our city, and a description of these slides will be given by Mr. J. Wells Champney. Mr. Charles Simpson has been about a year and a half in completing this collection, and feels sure it is the only one of its kind; and we would like all the members and their friends who take an interest in this subject to attend. There will be also shown, in connection with these slides of Mr. Simpson's, a number of beautiful slides made by Mr. James E. Brush, who was a former member of this society, until his business compelled him to relinquish it; and those of you who remember him will know that his work was above the average, and, without meaning any disrespect to those who are so active among us now, I think his work has never been excelled by the members of the society; and so I am sure all who attend this special meeting on the 18th will be well repaid.

Miss Catherine Weed Barnes, of Albany, at the recent lantern slide exhibition, authorized me to announce that if any of the members are passing through Albany and will take the trouble to call, she will be very glad to show them her studio and work.

The following resolution has been presented:

"Whereas, This society having heard of the death of Edward Anthony, of New York, on December 14, 1888, formerly the head of the firm of E. & H. T. Anthony & Co., and well known for many years in the photographic fraternity as a man active in promoting the art and science of photography, of high moral character, strict business integrity, and most agreeable personality, it is hereby

"Resolved, That in his death the community loses a noble example of uprightness of character and honesty of purpose which will always be revered in the memory of those who knew him as an example well worthy of following.

"Resolved, That in his endeavors to aid and improve apparatus used by amateurs, he not only won their respect but materially advanced the cause of photography.

"Resolved, That this society hereby expresses to his bereaved family its deepest sympathy in this hour of sad bereavement.

"Resolved, That a copy of these minutes be entered on the records of the society and an attested copy be sent to his family."

On motion of Mr. Simpson the resolution was unanimously adopted.

The *President*—We have a similar resolution for a former member of the society, Mr. C. Smith Lee, in the following form:

"Whereas, The Society of Amateur Photographers of New York heard of the probable death of its much respected member, Mr. C. Smith Lee, who is supposed to have perished at sea with all on board on the yacht Cythera, which sailed from this port on March 12, 1888, and desiring to express the feelings of regret and sincere respect of its members to his memory, offers the following resolutions:

"Resolved, That in the reported death of Mr. C. Smith Lee this society has lost a valuable member; one who, by his many excellent traits of character, won the friendship of all who knew him.

"Resolved, That a copy of these minutes be entered on the records of the society and an attested copy be sent to his family."

The resolution was unanimously adopted.

The detective cameras will now be examined in the library.

The meeting then adjourned and members gathered around the large library table to witness the development of the platinotype prints, which was very successfully done by Mr. A. C. Wilmerding.

Then, numerous styles of cameras were shown, in number between thirteen and fifteen.

SPECIAL MEETING IN COMMEMORATION OF THE FIFTIETH ANNIVERSARY OF THE BIRTH OF PHOTOGRAPHY, JANUARY 31, 1889.

The meeting was called to order at 8.15 P. M., *President* CANFIELD in the chair.

The *President*—The subject of our meeting this evening is announced to be "In Commemoration of the Birth of Photography." It was fifty years ago, in the year 1839, that the announcement of the discoveries of Daguerre and Fox-Talbot was made publicly.

We have been very kindly promised the assistance of several gentlemen this evening, especially Dr. Laudy, who has, at great inconvenience to himself, brought down from the excellent collection of the School of Mines, of Columbia College, the apparatus connected with daguerreotypy and a number of very interesting and beautiful examples which you will see hung on the walls, and which, I suppose, he will explain to you; and we will listen to him, I am sure, with a great deal of pleasure on the subject of the "Daguerreotype." (See page 142.)

At the conclusion of Dr. Laudy's remarks, Mr. J. B. Gardner said: I suppose I worked

those boxes which have just been shown you by Professor Laudy, for nearly thirty years ; I sold them to a man by the name of Beals, who had come from California to induce Mr. Pearsall, of Brooklyn, to renew this kind of work. He (Mr. Pearsall) afterward sold them to the School of Mines. I have made hundreds of pictures with those boxes, and if I had an idea that this apparatus would be shown here to-night, I would have brought some of the daguerreotypes that were made by means of it.

Professor LAUDY—I am extremely glad to hear Mr. Gardner make these remarks. I have personally tried to prevail on him at times to give me a statement of these facts, and I will now try to induce him, if I can, to write out the history of this apparatus, so that it can go on record in the collection in the School of Mines.

The *President*—I will now ask Mr. Abraham Bogardus to address the meeting. I believe Mr. Bogardus will speak of some of the "Trials and Tribulations of the Daguerreotype." I do not know whether he will go beyond the daguerreotype to the photographer or not ; but, of course, we will be very glad to listen to him.

Mr. BOGARDUS—*Ladies and Gentlemen* : I am afraid that giving me a text to speak from will remind you very forcibly of the ordinary after-dinner speaker. The President usually gives the text, and that is about the last you hear of it (laughter), unless, possibly, you may by chance hear of it, but not usually.

Here is something that I would like to send around to the members present before I proceed any farther. It is an original daguerreotype of Daguerre, taken from life, and I think it is a better one than the School of Mines has. (Laughter.)

The *President*—Who made that ?

Mr. BOGARDUS—It was made by Charlie Meade, of New York City, and Daguerre sat for it, as a great favor, for the purpose of sending it to America.

The *President*—What time ?

Mr. BOGARDUS—I cannot tell you the year. It was somewhere about 1846.

Mr. Bogardus then read his paper. (See page 139.)

The *President*—We have witnessed the enjoyment of Mr. Bogardus' remarks, and I am sure we are all very much obliged to him for coming here and giving us the interesting talk which we have just listened to.

Mr. Newton, our honored member, is with us to-night and will say a few words, I believe, on the general subject of, possibly, his

experience as an early amateur, especially in the dry plate process.

We are very glad to hear from Mr. Newton, and we know from his ample fund of experience that he could entertain us a whole evening without any difficulty. (See page 146.)

Mr. Beckers, who, I am told, is the oldest practical photographer in the city—at least, he enjoys that reputation—has very kindly come to us to-night, and has prepared a valuable paper, which, I understand, will occupy about ten minutes in reading.

We will now be very glad to hear Mr. Beckers.

Mr. Beckers then read his paper. (See page 144.)

The *President*—We have another veteran with us to-night, Mr. J. B. Gardner, the Secretary of the American Institute Photographic section, and we would be very glad to hear from him.

Mr. GARDNER—*Ladies and gentlemen* : I rise simply to say that this subject will be continued on the third Wednesday evening in February, in the trustees' room of the American Institute, and the hour is now so late that I propose that we call it an adjourned meeting until that time. I think we have had enough for to night. I think we are full (laughter), and I propose that those who feel any interest in the subject will remember the third Wednesday evening in February, at the trustees' room at the American Institute.

Mr. BEACH—I move a vote of thanks to the gentlemen who have assisted in entertaining us, and who have imparted to us such interesting facts in regard to the past of photography.

Motion seconded and carried.

Professor LAUDY—Mr. President, just one word. I was in hopes some reference would be made to-night to Talbot's discovery by the other speakers. I have a frame of his work here on the wall. I would like to call attention to some of the original Talbot-types, which were taken from nature, and I omitted to state anything about them, for the reason that I thought some of the speakers would refer to those on the wall as the original work of Talbot.

Mr. DUFFIELD—I move a vote of thanks to the School of Mines for allowing us the use of their apparatus and daguerreotypes this evening.

Motion carried.

Mr. DUFFIELD—I also move that a letter be sent to the Photographic Society of France, to the Photographic Society of Great Britain, and

the Photographic Society of Germany, telling about this meeting, and showing our appreciation of the efforts of the sons of these countries in the field of photography. I move that the President have that matter in charge.

Motion seconded by Mr. Stebbins and carried.

The *President*—I have only one further thing to suggest: There are no daguerreotypes hanging on our walls. I would give an invitation to those members who may have examples of daguerreotypes at home, to contribute one or two of them, so that we can have some frames like these which belong to the School of Mines, and start a little museum of our own.

Mr. DUFFIELD—And if any gentleman has any very valuable ones, we assure him that we will take special care of them. (Laughter.)

Mr. NEWTON—I would like to add, not as an amendment to the present resolution, but I would like to add to that remark that the President be authorized to make some for the Society. (Laughter.)

The *President*—If Mr. Newton will agree to assist me, I will agree to do it.

Motion to adjourn carried.

REGULAR MEETING, FEBRUARY 12, 1889.

The meeting was called to order at 8.15 P.M. *President* CANFIELD in the Chair.

On motion the reading of the minutes of the previous meeting was dispensed with.

The *President*—The first item on our programme to-night is, "Photo-gravure Processes," accompanied by a practical demonstration by Mr. Ernest Edwards, of the Photo-gravure Company, whom I have the pleasure of introducing to you.

Mr. EDWARDS—Ladies and gentlemen: It seems necessary to preface the little demonstration I am to give you with a few remarks on photo-mechanical printing, because I am afraid it would not be perhaps intelligible to you unless I did so, and a short written statement may serve as an introduction to the subsequent demonstration. (See next BULLETIN.)

[During the following discussion the process of printing from photo-gelatine and photo-gravure plates was proceeded with. Mr. Edwards had had set up a regular machine, so that those present were able to witness the actual modus operandi.]

The *President*—I have seen advertised in the French photographic journals an apparatus for producing work of this kind. They call it "The Black Auto-copyist," and it is sold very cheaply—I think the price is \$25 or

\$30. Is it possible for amateurs to produce anything satisfactory with that?

Mr. EDWARDS—Do you know what the "Black Auto-copyist" is?

The *President*—No, sir, but I have an idea of it.

Mr. EDWARDS—It is a piece of parchment paper on which is spread a layer of gelatine with a large amount of glycerine, on which a printing image is transferred. In the ordinary use of it, it is like the hektograph; is an improvement on the hektograph. You make a writing or drawing in ink of which the basis is tannin or tannic acid; and you transfer your writing to the surface of the gelatine. When, if you take an ink roller, and pass the roller over the surface of the gelatine, the ink will adhere where your writing has been and this copy is then transferred to paper. That is the "auto-copyist." I believe it is now proposed to add bichromate to the gelatine and then produce the image by light acting through a negative. The moment you do this it becomes photo-gelatine printing, and photo-gelatine printing is, apparently, a perfectly simple and easy thing.

Any gentleman can try it with an expense of \$10 to \$15, to start with. (Laughter.) But by the time he quits I am sure I don't know what the expense will be. (Laughter.)

Mr. E. F. HILL—How is that etched (referring to the photo-gravure plate then being printed from)?

Mr. EDWARDS—This plate is etched in this way: a layer of gelatine is put on the plate—a layer of gelatine which has been made sensitive to light. A positive made from a negative is printed on the layer of gelatine, and the copper plate with its adhering gelatine is then placed in the etching bath and afterwards plated with steel, which gives it a hard steel face.

A *Member*—If the impression on the gelatine is there, some of the gelatine will be removed before putting the acid on the plate.

Mr. EDWARDS—Yes; but as a matter of principle it is not necessary that it should be removed.

A *Member*—The acid will act through the gelatine.

Mr. EDWARDS—Yes.

A *Member*—Do you remove any of the gelatine?

Mr. EDWARDS—Yes; although some use the whole of the layer of gelatine, and do not dissolve any of it away.

A *Member*—Is there any difference between the first and the last impression?

Mr. EDWARDS—In photo-gravure the copper plate will, of course, wear by degrees. You have to watch it. Sometimes after two or three thousand impressions there will be a considerable wear. But if the plate is strong it will last with steel facing for eight or ten thousand impressions.

In printing from a photo-gelatine surface it is a little different. The work does not seem to wear so much by printing, but some accident is pretty nearly sure to happen to the plate. It will be scratched or abraded, or some accident of that kind will happen to it. The average printer will print from such a photo-gravure plate (referring to the plate being printed, which was about 8x6) in a day about three hundred impressions, and they will all be uniform or reasonably uniform.

I think photo gravure is easier than photo-gelatine printing. The photo-gelatine printer has a hard time of it. His plate is always doing just the wrong thing. It is either too wet or too dry, or the day is too hot or too cold. He has all the freaks of the weather and of gelatine to contend against; but in photo-gravure the plate when once finished is the same all the time, day and night.

The *President*—Mr. Edwards suggests that if anybody desires to examine the operation of the machine more closely they may have an opportunity of doing so.

(At this point Mr. Simpson moved a vote of thanks to Mr. Edwards for his interesting paper, and the trouble which he has taken in bringing his apparatus to the rooms and demonstrating the photo-gravure process; which was unanimously passed.)

The *President*—The further working of the process will have to be dispensed with, I am sorry to say, as we have several other things to show to-night.

I will say that I have on the table here a piece of apparatus which is of interest to most of the members. It will certainly be of interest to those who are interested in lantern slides.

Some two months ago I asked Mr. Colt of this city, who is engaged in the manufacture of articles for lanterns, etc., if he would not bring to the February meeting of the society this form of lantern, which he showed me then in an imperfect condition—that is to say, not fully completed according to his liking. He very kindly agreed to do so, and has brought it up here to-night, although he tells me it has not yet been brought to the point of perfection that he desires to have it.

It is an oil lantern for projection, something on the Argand principle, with a parabolic re-

flector light, which is movable up and down on this standard. The objective can be moved backward and forward.

Another new piece of apparatus that we have to-night to be shown is the new "Lilliput Camera," which is possibly familiar to some of you, and if the gentleman who has it in charge will show it to us now we will be glad to see it. Mr. Armstrong, I believe, is the gentleman who has it in charge.

Mr. Armstrong then exhibited the camera, which was encased in a neat leather box resembling in appearance an ordinary field-glass case. An aperture was provided in the front of the case for the lens, covered by a pivoted leather flap. On the under side of the box are two levers, one for setting off the shutter for time exposure and the other for instantaneous. Six miniature plate-holders, having different colored ends on the slides so that they may readily be distinguished, are contained in space in the box behind the camera. In operating it, after exposure, the cover is opened, the slide replaced and the holder removed to the rear of the box, and a fresh holder is inserted. The outside measurement of the camera is 4x4x6 inches, and it holds six double holders with twelve plates, 2½ inches square.

Specimen prints and negatives were shown, which were quite clear and sharp. Purchasers of complete outfits secure 108 plates.

The *President*—We want to try and keep abreast of the improvements made in photographic apparatus, and Mr. Duffield informs me he has here a couple of cameras of English manufacture, which he will show. One is a Ross camera and the other is a McKellan. This one has been rather ingeniously advertised. I think the owner calls it the McKellan "treble patent" camera. That simply means there are three patents on it, as I understand. (Laughter.) It is a 6½ x 8½, with patent focusing screen, roll holder, etc.

Mr. DUFFIELD—This camera was loaned to us by one of the lady members of the society. The novelty of this apparatus consists in the focusing screen, which does away entirely with the focusing cloth.

(Mr. Duffield then, by means of a screw, extended the camera so that the members could see its operation.)

Mr. SIMPSON—What is the name of the maker?

Mr. DUFFIELD—Mr. McKellan. It is made for a roll holder. This is the focusing device (indicating). It is made, as you see, of a series of india rubber ribbons, stretched hori-

zonally across the face of the focusing glass. These are separated by putting one half over the forehead and the other half over the chin and lower portion of the face, thus keeping the light out while focusing.

The *President*—It has been suggested that it is a great improvement over the old-fashioned way of taking your coat off and throwing it over the box. (Laughter.)

Mr. DUFFIELD—Now this is the Ross camera (adjusting the camera for inspection). You see it is on the same plan. It has a shutter the same as the other. But one new addition to the camera are these little pendulums, which show whether the camera is perfectly straight. As you move it, they will fall backward or forward just as you please. Then there is no tripod head; a circular aperture is cut out of the base board of the camera, on the inner edge of which are projecting pins, on which the legs of the tripod are affixed. This construction adds very much to the lightness of the camera without diminishing its strength. The camera has been brought here for your inspection by Mr. Frazer.

The *President*—These cameras can of course be examined after the other exercises of the evening. Our exercises thus far have been so interesting, and we still have so many things to show, possibly I had better give the notices for the ensuing few days of the month. As announced on the programme, which has been distributed, on Wednesday evening, the 20th, a special Lantern Slide Exhibition of the work of Mr. Richard H. Lawrence will be given, together with a paper, the title being "Through France and Norway with a Detective Camera."

The mere announcement of this entertainment will, I am sure, draw a crowded house; and, in connection with the Exhibition, I want to announce that the only way of securing the comfort of those who attend is to strictly carry out the plan of admission by tickets. It is intended that only those having tickets will be admitted on this occasion. We have sometimes been a little lax in this respect, but we have been compelled to resort to this measure as a means of self protection.

Mr. SIMPSON—I would suggest that you announce that members wanting additional tickets must apply for them.

The *President*.—Certainly, that is always understood. Those wanting more tickets should apply to the Secretary of the society.

Mr. CHAMPNEY—Mr. President, I never understood the tickets that have been issued to entertainments of this kind by the society. When two tickets are issued is it the rule that

one shall represent my entrance and the other the guest's?

The *President*.—That is the idea. Each ticket is for one admission.

Mr. SIMPSON.—A member can bring a friend if he holds another ticket.

Mr. CHAMPNEY.—That is, no member can be admitted without a ticket.

The *President*.—That is the idea. Since the last meeting there have been elected the following gentlemen: A. W. Weaver, E. F. Hill, H. F. Noyes, P. W. Dukerison, Jr., Guy Phillips, E. W. Thayer, F. Vilmar, Active; A. C. Wilmerding, Miss S. M. Cory, Subordinating; B. Irwin, Corresponding Member; and E. B. Gallagher has been changed from a Corresponding to an Active Member.

There is a matter of business to be acted upon. A successor to the present representative of the Lantern Slide Interchange is to be selected. The members of the society have received probably a notice of the prospectus of the third annual exhibition to be held in Philadelphia in April, and a gentleman who represents this society—the chairman of the committee, Mr. Duffield—has asked that members communicate with him whether they have pictures or not, and how many they will probably send.

(To be continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—G. F. M. sends a couple of prints and writes: Will you please let me know through the BULLETIN the cause of this bronze appearance on the picture of the man, especially on his hat? The batch that it was toned in toned very hard and this one turned yellow while in the wash water. The picture of little girl was made last fall. There are about a dozen, and they are all turning yellow in the same place.

A.—The bronze stains you speak of are from hyposulphite, and, judging from the look of them, probably by contact of the paper with poorly washed negatives that are slightly damp when the paper is put into the printing frame.

Q.—M. A. F. writes: I notice in your late Annual, on page 53, that "a plate carefully backed" with any non-actinic material in optical contact will stand double the normal exposure, etc. Will you kindly name the best or any good non-actinic material that is used

for the purpose of "backing" as described, and please explain the meaning of optical contact?

A.—Use the black varnish sold for painting iron, painting the back of the plate with it. After exposure, the varnish can be removed with a cloth wet with turpentine. "Optical contact" means in absolute contact after the manner of varnishing as given above.

Q.—M. T. incloses printed formula and writes: Referring to inclosed (I print all formulas I am using and stick them up on dark room wall for ready reference), see last line, "hypo soda, 1 ounce." Does this mean 1 ounce of undissolved soda to 8 ounces water, or 1 ounce liquid saturated solution of hypo? If the former, could you give proportions of water and saturated solution hypo to attain proper results? It is so much handier to work with the saturated solution. I will consult the "What our Friends Would Like to Know" for your reply.

A.—The figure given in formula for fixing solution means 1 ounce by weight. If you wish to use a saturated solution you must take 2 ounces by weight or $1\frac{1}{2}$ fluid ounces.

Q.—S. T. B. writes: I have experienced recently considerable difficulty in intensifying Stanley plates. These are my favorite plates, and I use them regularly. The difficulty is in getting the plate to blacken under the influence of ammonia after mercury. I have been very careful to wash well after fixing, and have tried intensifying both wet and after drying the plate. Still the same trouble—a yellowish green fog settles over the plate when placed in the ammonia. Long soaking therein does not alter the appearance of the negative. A soak in the hypo bath brings the plate back to its original condition. Sulphite of soda after mercury works better and does not stain or fog the plate, but I do not like the brownish tone of the negative as well as the black of the ammonia. If you can help me out by any suggestion in the BULLETIN I will be much obliged, as I have several thin, clear and (lacking good density) perfect negatives of children which I want to utilize in the printing frame.

A.—Rapid plates like those made by Stanley, Cramer and others are not easy to intensify, as they are usually thin from over-exposure. To intensify we like the method of using a half saturated solution of sodium sulphite after bleaching with mercury. In our hands, after very thoroughly washing out of the hyposulphite, we bleach with a half saturated solution of mercuric chloride, then wash well

and blacken in sulphite solution of above strength.

Q.—H. W., Jr., writes: Will you please inform me in the next BULLETIN how to mount a photographic print on a one-ply card-board or on such paper as Mr. Edward Anthony's picture in the BULLETIN of December 22, 1888? I always have trouble in mounting on account of curling, and this makes the print look badly.

A.—It is best to let the prints become nearly dry but still damp. Then use a stiff paste and dry under pressure with blotting paper between each print. By burnishing before the prints are absolutely dry the cards can be straightened out.

Q.—C. E. V. writes: Please tell me whether, when the "focus" of a doublet is mentioned without further qualification, the "back focus," or the "equivalent focus," is intended? I wish to apply a formula in which the above ambiguous term is a factor.

A.—In doublet lenses, or indeed with any lens, the focus mentioned is always understood "back focus," unless otherwise specified.

Q.—Y. R. S. writes: Herewith find a print. What is the cause of the spots? We have good prints from same negative cut from same sheet of paper printed at same time, and under same conditions. Bath 50 grains strong; $1\frac{1}{2}$ ounces of alcohol to gallon; a trace of alum. Paper N. P. A. The sheet that gives the sample we send gives also good prints. The spots show while the paper is on the negative, and remain all through subsequent operations.

A.—The spots on the paper you send are probably due to moisture settling on a cold negative. This may happen by bringing a negative out of a cold room into a warm one, or taking a negative from out-of-doors into a warm room.

Q.—J. R. C. writes: I notice in January 26 number of BULLETIN, page 49, you notice exhibition by F. C. Beach of three 4 x 5 prints on Pizzighelli's new printing-out platinotype paper. Can you inform me if this style of paper is in market, and of whom it can be obtained, ready prepared for use? *Harper's Monthly*, a short time ago, mentioned this paper, but have not been able to locate it; don't know if it is to be had in this country, or, indeed, if kept in prepared state at all. Captain Pizzighelli has a very interesting article in your "Annual" on preparation and use of platinotype paper, but my time and facilities are too limited to prepare it myself, even if I clearly understood the process.

A.—Pizzighelli's platinotype paper is advertised by our publishers and can probably be obtained from them ready prepared for use.

Q.—R. H. M. writes: Please give in the BULLETIN the best hydroquinone formula for portraits and for landscape, also for instantaneous work. Also please tell me how to dissolve bleached shellac in alcohol. I have been trying to dissolve some for two months: 2 ounces in 8 ounces of alcohol; but by mistake 1 teaspoonful of oil of bergamot was added; has this caused the trouble?

A.—Several excellent formulas have been given in Dr. Vogel's recent articles in the BULLETIN. See "Letter from Germany," in some of the recent numbers. Also in the letter of our English correspondent under the head of "English Notes," in recent numbers. All these formulas are good, but something depends upon the manner of working; some are good for one and some for another. We cannot understand your trouble with the shellac; we have often dissolved it readily, and don't think the oil makes any important difference; perhaps the alcohol is too weak.

Q.—G. A. P. writes: Respecting the use of hydroquinone as a developer, I would say that I have found difficulty in obtaining good prints from negatives developed with Dr. Vogel's two-solution developer, and from several of the one-solution developers. Can you inform me of any way to get negatives of good printing qualities, instead of the translucent gray tones which appear in all my negatives developed with hydroquinone? A strong, sharply defined negative, with good contrast between sky, land and water, will frequently print up

with no contrast whatever, and with the appearance of a very much over-timed plate. Negatives of the same intensity developed with pyro, would make a splendid print. I forward herewith a print such as I speak of for your inspection. A number of my friends are having the same experience, and an explanation or remedy published in the columns of your BULLETIN would greatly oblige.

A.—Your trouble is probably due to under-development. You have to carry the density much farther with hydroquinone than you do with pyrogallol. We also prefer to use a little sodium hydrate (caustic soda), with the hydroquinone, say two grains to the ounce in addition to the usual amount of sodium carbonate and sulphite.

Views Caught with the Drop Shutter.

MR. C. C. HOWLAND, of Cincinnati, was recently in New York on a visit, and called at our office, and we renewed former pleasant memories.

THE photographic business of the Scovill Manufacturing Company has been transferred to a new firm, the Scovill & Adams Company, with Mr. W. Irving Adams as *President*, and Mr. H. Littlejohn as *Secretary*.

DR. EDWARD L. WILSON has purchased the American copyright of Mr. Hepworth's "The Book of the Lantern," and will soon bring out the work for American readers. Mr. Hepworth's name is a sufficient guarantee for the excellence of the work.

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Benjamin Harrison,
President U.S.A.

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ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

MARCH 23, 1889.

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MAKING UP FORMULAS WITHOUT WEIGHTS AND SCALES.

SEVERAL years ago an effort was made to introduce tablets or pellets of pyrogallol and alkali-mixtures of convenient size in order to overcome the necessity of weighing out the constituents of the developer. These tablets generally contained pyrogallol with or without the admixture of sulphite of sodium or other chemicals to form part of the developer, and the balance of the developer, carbonate of sodium or potassium or both, together with sodium sulphite, with or without bromide, was contained in a separate tablet. By taking one or more of each kind of tablets and dissolving in a measured quantity of water, the necessary developer was compounded.

But unfortunately these tablets were a failure and never became popular, the causes of this failure being due to several circumstances. In the first place, owing to the manner of compressing the pyrogallol into tablets, it soon became discolored and gave a very dark colored solution when dissolved in water. Again, this discoloration was not merely due to a darkening of the surface, but extended to the interior of the mass. This was the principal drawback to the use of pyrogallol in tablets.

In regard to the alkali tablets, another and equally serious drawback to their use was the want of latitude which their constitution prevented those who used them from exercising. They were compounded from certain set formulas known only to the manufacturers, and the photographer who used them could only take more or less of the whole mixture without any chance of variation to suit circumstances or any ideas that he might personally have in regard to the mixing up of his developer. In other words, they were like patent medicines, which every sensible person refrains from using because their constitution is not known.

The idea of the tablets in the abstract is a good one. To be able to do without weights and scales, and take a certain number of grains of material by simply counting out tablets of it, is very desirable, especially to amateurs. With this object in view, and after considerable experimenting, our publishers have succeeded in making up tablets of all the chemicals generally used in developers, in a pure state. Thus they are now making tablets of carbonate of sodium, carbonate of potassium, sulphite of sodium, bromide of potassium, hydroquinone and pyrogallol, in definite sizes. By the use of these tablets and a single measuring graduate, the photographer can make up his developer to suit his own ideas at

a moment's notice, and without the necessity of using weights and scales, with their attendant loss of time and inconvenience.

This new enterprise on the part of our publishers is a step in the right direction, and we believe it will be appreciated. We are a little doubtful about the keeping qualities of the pyrogallol tablets, but are assured that they have been compressed by a new method, which will at least extend their keeping qualities if it has not entirely overcome all difficulties. But we do not think this part of the question of much importance, for the days of pyrogallol are numbered, and we believe that hydroquinone will keep well in tablets. Nevertheless, if neither of these organic substances should keep, the comfort of having tablets of other chemicals, which keep better in a compressed form than in crystals, is not to be underrated, and we believe this method of using photographic chemicals will become well established in the future.

We believe that the hydroquinone will keep many months in the form of tablets, and this is practically all that is necessary. Pyrogallol in crystals will deteriorate in time, but it is good for at least a year if care is taken to keep the package closed and in a dark place. Hydroquinone keeps very much better than pyrogallol under ordinary circumstances; we therefore feel assured that these tablets will keep almost indefinitely.

We are prepared to hear some one say, Oh, yes! tablets are all very well, but the idea is not a new one. To which we simply reply, we have not gone into ancient history, but they were not on the market until to-day in the form mentioned above, and we believe them worthy of attention even if the alchemists of the middle ages had the idea and failed to utilize it. We are satisfied that this form of photographic chemicals will prove a boon, at least to amateurs.

EDITORIAL NOTES.

ONE of the latest ideas in photography is to make a cannon ball record its course through the air, or, in nautical phrase, keep its own log. For this purpose it is proposed to inclose within the ball a sensitive surface, and a spot of light falling on it from an opening in the outer shell will determine the wanderings of the projectile in its flight. We have not seen any prints from such negatives yet; these may come later.

THE Berlin Amateur Photographic Society are arranging a jubilee exhibition of all branches of photography, scientific, technical and historical, to celebrate the fiftieth anniversary of photography. The exhibition will open in September and close in October of this year. For American exhibitors collections will be made by the publishers of the BULLETIN, and should be marked "For Berlin Exhibition, care of E. & H. T. Anthony & Co., 591 Broadway, New York." We hope our readers will take note of this and send contributions.

THE exhibition at Philadelphia of the united societies of Boston, Philadelphia and New York takes place April 8th to 20th, and exhibits should reach Philadelphia before March 25th. There is no doubt the exhibition will be a grand success.

TO THOSE who have written to us about copies of the pictures of the moon taken with the great Lick telescope, we would say, that Professor Holden, who

has charge of the observatory, has very kindly given us permission to have extra copies printed from the original negatives, and our publishers will have them ready at an early date.

THE first lantern slide exhibition of the Stevens Photographic Society was held at the High School building, Hoboken, N. J., on March 12th last. We regret that we could not be present, and tender our best thanks to the officers for their kind invitation. Many of our scientific schools now have photographic societies that are doing good work and we are glad that Stevens Institute is among the number. Professor Morton's old love for the art is doubtless the incentive for the new organization.

ONE of the most enjoyable entertainments recently given by the Society of Amateur Photographers of New York was a lantern slide exhibition entitled "Illustrated Boston," by the Boston Camera Club. Among the pictures was the first map, the city of to-day, harbor, docks, yachts, ferries, the navy yard, Copp's Hill burying ground, Old South Church, herdies and hospitals, railroad stations, the old market, Faneuil Hall, Custom House, and the massacre.

A picture of the old State House was shown, from which building George III. was proclaimed King, the last of the colonial Kings, and where, later on, the Declaration of Independence was read. Then followed Post Office square, City Hall, King's Chapel, Institute of Technology, Art Club, Trinity Church, the Common and the frog pond, and other places dear to the hearts of Bostonians.

The entertainments in preparation are "The Metropolis of America," by the Society of Amateur Photographers of New York; "The White Mountain Region," by the Boston Camera Club; "Illustrated Chicago," by the Chicago Lantern Slide Club; "Glimpses of California," by the Pacific Coast Amateur Photographers' Association; "The Creole City," by the New Orleans Camera Club; "Philadelphia Illustrated," by the Photographers' Society of Philadelphia; "Cincinnati Illustrated," by the Cincinnati Camera Club; "St. Louis Illustrated," by the St. Louis Camera Club; "Louisville Illustrated," by the Louisville Camera Club; "Baltimore Illustrated," by the Baltimore Camera Club.

THE Yonkers Photographic Club was organized on February 15, 1889, by the election of the following officers: G. Livingston Morse, *President*; Robert M. Reeves, *Secretary and Treasurer*; and the following Executive Committee: Salter S. Clark, R. Eickemeyer, Jr., and F. W. R. Eschmann. The club has forty members and the roll is still growing. A very fine suit of rooms, overlooking the Hudson River and Palisades, has been secured in the Deyo building, corner Warburton and Wells avenues, which are now being fitted up in the most approved style. Regular meetings are held on the first Friday of each month and the annual meeting on the first Friday in April.

W. E. GRAHAM, of Schroon Lake, sends us an excellent view taken at Taylor's, in the Adirondacks, just after a heavy snow storm. The fantastic forms of the snow are very well caught and form an interesting snowscape. The picture is clear, sharp and very well done from a photographic point of view.

ANOTHER good picture comes from Edgar T. Scott, of Amherst, Mass. It is a clean cut, well taken picture of a country farm-house, nestled behind

some old elms, denuded of foliage, but whose graceful arms tell of the beauty of the spot in warmer days. The work is excellent in every respect.

THE New York Camera Club held an "opening night" at its rooms, 314 Fifth avenue, on March 13th. Mr. George Marshall Allen exhibited his collodion slides of the Yosemite region, and the members and their friends enjoyed a pleasant evening inspecting the club's new quarters. We hope soon to be able to describe the new club rooms for the benefit of our readers.

WE are indebted to Professor S. W. Burnham, of the Lick Observatory, for a reprint of the "Double Star Observations" made by him with the great telescope. The pamphlet exhibits much patient research on the part of the Professor and tells of the discovery of many new stars. We tender our best thanks for his kind remembrance.

THE POSTAL PHOTOGRAPHIC CLUB.

ABOUT two and a half years ago we were delighted every now and then with a ramble through one of the albums of the Postal Photographic Club. All at once these albums ceased to come to us, and we thought that, like too many of these amateur efforts, the club had passed away, and nobody took note of its departure. Some time ago we were very much pleased to hear that this delightful method of comparing the progress of our art among amateurs was about to be revived, and a few days ago we had the pleasure of receiving a note from Professor Randall Spaulding, accompanied by two of the albums of the rejuvenated club.

We are glad to note that the management of the club is now in the hands of Professor Spaulding, Dr. Max Mueller and Mr. Vernon Davey, and we feel assured that under their guidance it is destined to become all that was expected of it by its original friends and those who labored for it in former years.

In the albums we have received there are some beautiful examples of photographic skill, and, what is particularly encouraging, a marked advance in various printing methods, a phase of photographic work sadly neglected by amateur photographers.

"Morning," a particularly handsome bromide print, from Mr. F. A. Jackson, of New Haven, is one of the best pictures in the albums. A curve in the road, a beautiful tree with its graceful branches, the rich foliage of the hedgerows, and the soft light of the early morning, with its mellow shadows, gives a scene of surpassing beauty and full of the dreaminess of the artist's thought.

A number of architectural studies by Mr. J. Albert Cole, of the Washington Camera Club, are thoroughly well done, and speak of clean, sharp lens effects and great skill in the management of the development.

"Sheep," a group of these animals by Miss Littlejohn, of Brooklyn, is a very pretty study in light and shade, and an excellent picture of an uncommon subject.

An excellent "Interior," by Dr. Max Mueller, showing a private billiard room with its comfortable accessories, is very well done.

Two flash-light studies by Mr. H. Harrison Suplee, of Philadelphia, entitled, "Almeh" and "Afternoon Tea," are well caught and the light well managed. A little more side light from white reflectors would improve the modeling; nevertheless the work is excellent in this class.

"On the Rockaway," by Professor Spaulding, is a little gem of scenery, soft and exceedingly picturesque.

"Dandy on his Doorstep," by Miss Gillender, of Tarrytown, a pug dog with a very well caught look of interest in photography, and a caged parrot in the background very much interested in said dog, make an unusually life-like and somewhat humorous study. Miss Gillender also contributes a view of "Irving's House" which is particularly fine in the foliage effects caught.

"A Jolly Pair," a couple of bright looking babies, by Mr. Vernon L. Davey, should be seen to be appreciated; they are full of baby-life and joy. Another good effort by the same contributor is "Blossoms," an excellent picture of a Wistaria in full bloom, with a group of children peeping through its branches.

"Eavesdropping in Disguise," another picture by Miss Littlejohn, also "Falls, Mountain Dale, N. Y.," and a particularly good interior, all show unusual skill on the part of this lady.

Vase and Flowers, showing the effect of ortho-chromatic plates made with erythrosine, the work of Dr. H. G. Piffard, using magnesium flashed with gun-cotton, are excellent results in the comparison of plain and ortho-chromatic plates. A view from "Cornwall Heights," using an ortho-chromatic plate and giving a view with a distance of eight miles, the foreground being about nine hundred feet from the lens, tells more than words the beauty of this method of photography.

"A Winter Landscape," by Mr. W. T. Colbron, the President of the New York Camera Club, is a very fine piece of photographic work; but the view is decidedly dreary and lacks the feeling that some foliage in the scene would give to the same landscape.

"Rock Creek, Washington, D. C.," a sepia platinotype by Mr. J. Albert Cole, is a very pretty picture, but a trifle too dark, to our minds.

"In the Maple Grove," a scene in a New Hampshire sugar grove in winter, with a team of stout oxen drawing a heavy sled, carrying a sugar barrel, is a very good piece of work, by Mr. Samuel Wadsworth. Also "After the Snow Squall," by the same gentleman. Both these snowscapes are exceedingly well caught; for the subjects are by no means easy, and we see more failures than successes in this class of work.

"Chester Creek," by Dr. Max Mueller, a very pretty little view of a stream rippling along with all the charm and beauty of a spot where trout might love to hide and dart at the unsuspecting fly.

A very handsome platinotype called "Landscape with Elms," by Mr. W. A. Prentiss, is a gem of photographic work of this kind. The graceful trees, the soft and yet well defined shadows, the detail in the distant scene, all make the picture a very artistic one.

"Sperry Glen," another bromide by F. A. Jackson, is an excellent effort on this paper and shows what can be done in skilled hands.

"Good Evening," by H. Harrison Suplee, a flash-light study of a lady in a white dress emerging from behind dark portière curtains, is an excellent effort; but we agree with one of the members of the Club that the title is not good, the eyes are too wide-awake for evening. The same contributor has another which is one of the best flash-light effects we have seen. It is called "What Shall I Say?" a lady sitting at a secretaire writing, with the quill pen held to her mouth in a thoughtful mood. The idea is well caught and the detail in the picture is exceedingly well brought out.

"Roadside," a little gem of a waterscape, by F. C. Briggs, is very pretty and makes us wish to see something more of the same member. It is full of fine detail in the foliage, combined with soft effects of light and shade.

We can only notice one other gem, "On the Brandywine," by Dr. Max Mueller, a charming little view full of artistic feeling and showing excellent photographic skill in its production.

Altogether we have enjoyed our ramble through these albums very much, and advise our readers to obtain a look at them if they can get the chance, or else become members of the club. We tender our best thanks to Professor Spaulding for his kindness in giving us an opportunity for so much enjoyment.

LETTER FROM GERMANY.

Ortho-chromatic Photography.—*Pyrocatechin, a New Developer.*—*The Chemical Action of Magnesium Wire Burning as Single Wire, and Three or Six Fold.*
—*Permanency of Writing on Gelatine Plates.*

JUST now I have received yours of February 9th with the interesting article of Dr. Piffard about ortho-chromatic photography. I notice, with satisfaction, that this field of photography, disclosed by me (having already discovered and published in 1873 the principle, according to which ortho-chromatic plates can be produced by coloring with certain coloring matters), meets with more and more interest in the United States. In Germany it is nothing new any more. I know that thousands and thousands of German photographs, reproductions from oil paintings, exist in the United States. All these pictures have exclusively been made with ortho-chromatic plates. Since 1883 the large establishments for reproductions in Germany use no other but ortho-chromatic plates, and while Dr. Piffard expresses himself very unfavorably about eosin silver, these plates here gain daily in popularity for landscape photography. Some stock dealers even, who do business exclusively in amateur articles, as for instance Weber in Leipzig, will keep no other plates but the eosin silver plates. But I know also that Mr. Kurtz, in New York, for the last four years has made copies of oil paintings on azalin plates, which fact is not mentioned at all by Dr. Piffard, although the subject has often been discussed in your journal, and he has had sufficient opportunity to see a great number of views (perhaps several hundred) made with the same at Kurtz's gallery.

Dr. Piffard was very kind in mentioning my name in connection with the matter, to undervalue what I recommended as first-rate and to speak about "untenable theories," while those set up by him are more doubtful than the ones he calls untenable. He will kindly permit me to correct him in some instances. He mentions in the history of the matter Mr. Ives' name first, although Mr. Ives did not begin with ortho-chromatic photography until 1878, while I have worked it since 1873. He says that Mr. Ives worked chiefly with collodion, whereas the other investigators devoted their energy to ortho-chromatic gelatine plates. That is not quite correct. I came to my discovery by studying the absorption bands of different colors with the spectroscope, and concluded from Draper's theory of the connection between chemical action of light and the absorption of it by different silver salts that the dyes I examined might have the power to sensitize bromide of silver for the colored rays they absorb in the spectroscope. I tried it first with corallin. This gives an absorption band in the greenish yellow. I dyed a collodion plate with it and observed that

this became sensitive to greenish yellow of the spectrum. I then tried aniline green. This gives in the spectrum an absorption band in the red and exactly in accordance with this it sensitized a collodion plate for red. Afterwards I made experiments in the same way with fuchsin, magdale red, aldehyde green, methyl violet and cyanin, and all confirmed what I had expected from the spectroscopic examination—*i. e.*, the dyes mentioned sensitized the bromide of silver for the same colored rays they absorbed in the spectrum. In this way I confirmed my theory which led me to the said discovery; that is: Certain dyes have the power to sensitize the bromide and chloride of silver for those colored rays which they absorb in the spectroscope. In this way I worked from 1873 to 1875. Becquerel was the first to follow me, and observed in 1875 that chlorophyl sensitizes the collodion for red and yellow rays, and that it gives, exposed to the solar spectrum, three maximum bands of chemical action, exactly in accordance with its absorption bands. Thus my theory was confirmed again, and the same was the case with eosine, carmine and Judson blue, first tried by Colonel Waterhouse, Calcutta, and published in 1876. After such success by me and others I am justified to maintain a theory confirmed by first-class scientific men. From the dates given Dr. Piffard will learn that he is wrong if he says, page 80: Carmine and fuchsin don't "orthophotize" (will say, are not color sensitizers). If Dr. Piffard will follow the fluorescence theory, I advise him to read Eder's researches, who has thoroughly contradicted Schiendl's assertions about this theory. Dr. Piffard says further that he prefers ordinary eosin plates to eoside of silver plates. I would also recommend to him here to read Eder's researches and not to use Mallmann's formula, but those I have published two years ago in "Photographische Mittheilungen," Vol. XXIV, page 87,* and Vol. XXIII, page 211. In the last-mentioned volume he will also find two landscape pictures from the same subject, with the same exposure at the same time, and he will learn from them that the eoside of silver plate is with regard to foliage in the foreground far superior to the ordinary plate, which will contradict sufficiently his assertion, page 77 of this journal. Further, I take the liberty to remark that he is mistaken about the nature of erythrosin and eosin B. The bluish eosin is identical with erythrosin; both are tetraiodo-fluorescines. The best colors he will find at E. & H. T. Anthony & Co.'s. They import them from Germany. Azalin can be had from Mr. Kurtz.

The hydroquinone developer is now in the foreground and drives away pyro and iron more and more. But it seems this has found already a new competitor in pyrocatechin.

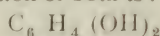
Dr. Arnold writes to me about it: "Although the gram of pyrocatechin costs at present still 1 mark, while the price of hydroquinone for the same quantity is only 4 pfennigs, the preparation is applicable, as its capability of reduction is in proportion to hydroquinone about 15 to 1. I use 0.05 gram pyrocatechin and 5 grams carbonate of potassium, dissolved in the necessary quantity of water, for each plate, 18 x 24 cm. The pyrocatechin being more easily soluble in water than hydroquinone, I fix my developer when traveling by adding to the soda solution for each plate of 18 x 24 cm. a very small pinch of pyrocatechin and dissolve

* The formula is:

Erythrosin (solution 1:100 in water).....	50 c. c.
Nitrate of silver (solution 1:1000).....	50 "
Water (distilled).....	100 to 200 "
Liq. ammonia (sp. gr. 0.95).....	2 to 3 "

the same by shaking. The new developer possesses all the advantages described in *Nature*. Particularly may be mentioned the pure and harmonious development, and that the development can also take place proportionately quick in very cold solutions. The developed plates can be fixed in day-light after slight washing. According to the degree of light, the quantity of carbonate of potassium is increased or reduced. Bromide of silver gelatine paper and transparencies are treated with the same developer as mentioned above. There is no doubt that as soon as the pyrocatechin is used in larger quantities, its price will be greatly reduced, and that at such a time it will be a strong competitor with hydroquinone. About the durability of the solutions I have still some tests under way, but I hope that in the meantime this preliminary communication may animate others to further tests."

To this I would remark that pyrocatechin as well as hydroquinone are isomeric bodies. The composition of both is :



The magnesium flash photography has made further progress. It is remarkable that the first ones who introduced flash pictures, Messrs. Gädicke and Miethe, used considerable quantities of magnesium—for instance, for a portrait at least 1 gram—while Mr. Schirm accomplishes the same thing at present with 5 centigrams. This fact appears now more explicable by considering the experiments with magnesium wire.

Mr. Haberlandt asserted last year that six wires, twisted together and burned at one time, do not furnish as much light as a single wire which is as long as all six together. Further tests were promised.

These tests have now been made by Mr. Schultz-Hencke, and the following figures prove that Mr. Haberlandt is correct :

WEIGHT OF THE BURNT MAGNESIUM.	DURATION OF BURNING.	DEGREE IN VOGEL'S PHOTOMETER, 25 CM DIS- TANCES.	RELATIVE EFFECT OF LIGHT - AVERAGE.
<i>1. Single Wire:</i>			
3.774 grams.....	19 minutes.	14-15 degrees.	} 28
3.450 ".....	22 "	14-15 "	
3.4418 ".....	16 "	14 "	
<i>2. Double Twisted Wire:</i>			
3.6878 grams.....	12 minutes.	13-14 degrees.	} 22
3.6856 " (the lamp extinguished several times).....	13 minutes 16 seconds.	13 "	
3.7086 ".....	12¼ minutes.	13 "	
<i>3. Triple Twisted Wire:</i>			
3.698 grams.....	8¾ minutes.	12-13 degrees.	} 18
3.7096 ".....	7½ "	12-13 "	
3.6744 ".....	8 "	12-13 "	
<i>4. Six Times Twisted:</i>			
3.400 grams.....	4 minutes 45 seconds.	10-11 degrees.	} 12.50
3.4540 ".....	4 " 45 "	10-11 "	
3.3695 ".....	4 " 45 "	10-11 "	

The burning took place with a Süss lamp. The quantities of wire being about equal, it can be seen from the table that a wire of a certain weight, burnt single, furnishes about two and a quarter times as much light as the same wire twisted six fold.

Herr von Gothard recommends an expedient to put writings on gelatine plates. He wrote with a finely-pointed steel pencil. The writing done with the same develops black and is durable. I explain the action as a chemical one of the steel point. Dr. Wolf, from Heidelberg, writes now to me :

“This explanation is not admissible, having made for a long time the same kind of writing after the proceeding of Gothard, but with a gold needle. On all of my star plates the same writing appears fine and deep black. An action of the material ‘iron’ is therefore excluded.”

My friend Leonard and myself have just now tested a number of other materials with regard to the “action of pressure,” namely : 1 steel (iron) ; 2, gold ; 3, nickel ; 4, aluminium ; 5, brass ; 6, glass ; 7, sealing wax ; 8, bone ; 9, wood ; 10, tobacco.

Bone acted best, wood and sealing wax the least, but all had a photographic action.

According to these tests it is, without doubt, a mechanical pressure that causes developments not only with collodion plates, but also with gelatine plates. If former tests gave contrary results, it must have been due to too slight a pressure.

BERLIN, February, 1889.

AMATEURS AND PROFESSIONALS.

BY AJAX.

It is a question whether the ground taken in the BULLETIN, page 114, in regard to the line to be drawn between the amateur and professional in the art photographic, is not too sharp. Many persons will doubt the possibility or propriety of considering an individual a professional who has never made a photograph for love nor money, and, in fact, who does not know how to take a picture. The societies formed a few years since started out with the idea that the professional was a very dangerous kind of a person. He might be tolerated if he was a simple picture maker like Sarony, Bogardus, or Fredricks; but no one who had anything to do with making or selling cameras or other apparatus could be safely allowed to come into a society on the same footing as those who practiced the black art for pure love. This idea was enforced in the most rigid manner. It was universally conceded that there must be a Shibboleth and that he who could not frame to pronounce it properly must be cast into the outermost darkness.

This idea has not changed in the least and society men are as rigid in their ideas of entire exclusion of professionals as they ever were. It is beginning to be found, however, that many valuable men are cut off from entrance where they are wanted. If the line is to be so sharp, then to know just when it should be drawn we must go back to the reasons which make the line necessary. When the New York Society of Amateur Photographers was first formed, the great fear was that it would fall within the influence of some great photographic firm and become a handle to a business instead of an independent society. In spirit,

though scarcely in words, they adopted the theory of the athletic clubs which was stated in the BULLETIN.

This theory is that the trade makes a man professional. Hence there are men who cannot be amateurs even though they never competed in any athletic game. The idea of trade or connection with it introduces the element of commercial influence. It was the fear of this commercial influence which pervaded the New York society when it was first organized.

The bias resulting from business interests is certainly powerful. It is considered so important in athletic circles that a man connected with a bicycle factory whether a rider or not is classed as professional. The same would be true with any one in a sporting goods house. Probably the workmen in a canoe factory would be barred from an amateur canoe race.

Now it is easy to see that as far as actual harm to the amateur society is concerned, the man who has a photographic invention to sell is more dangerous and harmful even though not a photographer than the professional photographer who sells pictures. It is easily seen that the inventor, the camera maker, the man who has all sorts of good photographic patents in his head, is far more likely to make an improper use of the society than the man who makes pictures for money.

It appears most reasonable that one of two things should be done. The rules should be made so strict that no person who is connected in a business way with photography or who has a pecuniary interest in the art should be allowed in the amateur class. This should include lens makers, camera makers, dealers, agents, and in a word all who have a monetary interest even of the remotest kind. On the other hand, the rule should be relaxed and should be made to cover only those who sell photographic goods or inventions.

It may appear strange that no mention is made of those who take photographs for money. So far as their influence upon the society goes it can only be for good, and hence it would be a pity to exclude them from the benefits or to deprive the society of the advantages which would come from their membership.

It will probably be found that the best course is to altogether ignore these distinctions of amateur and professional. Let the name be the keynote of the class. If the art is practiced for love it matters little whether there is an income also. Some of the most enthusiastic "Lovers" (amateurs) of photography that this country has had have been men who earned their daily bread by taking photographs. On the other hand, there are numberless men posing as amateurs whose sole object appears to be the disposal of their inventions and the introduction of their apparatus.

Will it not be quite as well in the future, therefore, to either abandon the distinction entirely between the classes, or to draw the line with all the sharpness possible? Any middle course works injustice and aggravates the evils which it was desired to avoid.



I READ it with much interest, as it tells me what are the workings of men who are investigating the unknown world, for the benefit of us poor mortals, who are merely learning our alphabet of the wondrous art,

CHARLES SLOSSON.

PHOTO-GRAVURE PROCESSES.

BY ERNEST EDWARDS.

[Read before the Society of Amateur Photographers of New York, February 12, 1889.]

In general terms all practical photographic methods and processes depend on the action of light on one or the other of two substances.

Light, under certain conditions, blackens certain salts of silver.

Light, under certain conditions, hardens certain organic substances, such as gelatine.

By the first action we produce our negatives and print our silver photographs.

By the second action we produce printing plates from which we print with ordinary printing ink.

The application of this second action is the foundation of the various processes of photo-mechanical printing.

All of these depend, of course, on both actions of light—first in the production of the negative, second in the production of the printing plate.

There are four leading lines of photo-mechanical printing methods—photo-engraving, photo-lithography, photo-gelatine and photo-gravure.

Photo-engraving is understood in this country to mean “cuts to print with type.”

Photo-lithography is the process by which a stone is prepared for ordinary lithographic printing by photography instead of by hand.

In both photo-engraving and photo-lithography the prints must be made in dots or lines, but by an ingenious device the half tone of the photograph is closely imitated. This is effected by breaking up the half tone into a series of very fine dots or lines.

The methods mostly in use by us are those which give true photographic half tone.

These are the photo-gelatine and the photo-gravure methods.

The photo-gelatine process is known under a multitude of names; Albortype, heliotype, artotype, Lichtdruck, Indo-tint, collotype, are some of them, but they all mean the same thing; that is, printing from the surface of a layer of gelatine, variously supported, and on which a printing image has been produced by light.

The *modus operandi* of obtaining such an image is, in its broad principles, simple enough.

An ounce of gelatine is dissolved in, say, ten ounces of water, at a temperature of 100 degrees Fahr. To this solution is added 40 to 50 grains of bichromate of potash and sufficient alcohol to make an easy flowing liquid. This is flowed over a plate of glass or metal and dried in an oven at a temperature of 120 to 140 degrees Fahr. on a level plate, so that when dry a very thin, even solution of bichromatized gelatine remains on the plate. The gelatine-coated plate is exposed to light under a negative, and now comes in the second action of light. The light passing through the negative hardens the gelatine in the shadows, partly hardens it in the half tones, and produces no effect where it is prevented from penetrating by the opaque parts of the negative.

The gelatine-coated plate, which now has the printing image produced on it, has only to be washed in water to prevent the further action of light when it is ready for the press.

It is inked up in the same general method that a lithographic stone is inked. But the sun has been the artist and has drawn the half tone of the photograph as no hand could have done it.

Photo-gelatine printing, to the reader and onlooker, seems to be the simplest thing in the world.

On account of the "contrary" character of gelatine, it is in truth the most difficult, as those who have been longest at the work best realize.

It will be seen that the reproductions by this process have a character all their own, and for a certain delicacy of result and true photographic effect they are unapproachable.

In the photo-gelatine process it will be seen that a new printing surface or material, gelatine, has been brought into use.

In photo-gravure, the oldest printing material, copper, and the oldest method of printing, is employed, but the action of light takes the place of the engraver's tool. There is not time at my disposal to do more than briefly sketch the processes employed.

The result desired to be obtained is an intaglio plate to be engraved by photography and to be used for printing on a copper plate press.

In the photo-gelatine process we have described how a plate is coated with a thin, even layer of bichromated gelatine made sensitive to light. If we prepare this gelatine on a copper plate and after the action of light place the plate with its light-produced image in an etching bath, it is evident that the etching fluid will penetrate the gelatine where the light has not acted, and where, therefore, the gelatine is not hardened. It will penetrate less where the light has hardened the gelatine slightly, and it will not penetrate at all where the gelatine is altogether hardened by light. In this way we have a plate etched more or less deeply, according to the gradations of the photograph, and therefore reproducing all the gradations of the photograph. This, very broadly, is the underlying principle of our process of photo-gravure.

Two essential conditions must be observed, however, in order to make the process practical.

In the first place, in using a negative to print on the gelatinized copper plate, it is apparent that the picture would be a negative. Therefore a positive or transparency must be made from the original negative to print on the gelatinized plate, in order that the final picture may be a positive.

The other necessity is that there must be a "grain" on the copper plate in order to give it an ink-holding capacity. This is effected by "laying a ground," as in the aquatint method, or by dusting the surface with resin or asphalt which is melted by heat—in both cases, of course, before the application of the gelatinous surface.

The etching fluid does not penetrate these fine points of resin, and the underlying copper is protected and remains in the shape of a number of minute pyramids, which prevent the ink being wiped out. The rest of the process of reproducing photo-gravure pictures is the ordinary method of copper plate printing, requiring, however, greater skill and care in its execution.

Whilst photo-gelatine printing is marked by the delicacy of its results, the characteristic feature of photo-gravure is its strength and richness, which may be further heightened in the various steps of the process, as well as subsequently, by the hand of the graver.

THE DETECTIVE CAMERA ; A SUMMARY OF EXPERIENCES AND OPINIONS.

BY HARRY T. DUFFIELD.

[Read before the Society of Amateur Photographers of New York.]

AMONG photographers, especially amateurs, the camera which has been generally, but unfortunately, named "The Detective" has become a great favorite; and it occurred to the writer that a paper summarizing the experiences and opinions of experts with this instrument would be of interest. Forms of questions were prepared and sent to the secretaries of a number of photographic societies in this country. It was the intention of the writer to send these forms to all of our societies, but time prevented him from so doing.

The secretaries were asked to place the forms of questions into the hands of those members of their societies who were most expert with the detective camera. Thirty-nine sets were returned with the questions answered, and as they come from ladies and gentlemen familiar with the instrument, their statements are entitled to have much weight with us. The writer returns his thanks to the secretaries of our sister societies for their kindness in complying with his request, and to the ladies and gentlemen for their courtesy and promptness in replying to his queries.

The first questions asked were, the name of the answerer, the society of which he is a member, and the make of the camera. Twelve of the thirty-nine are home-made or made from owner's designs. One says his is "a leather covered shoe-blackening box." The lenses are the make of Ross, Dallmeyer, Beck, "Euryoscope," Watson, Suter, Beck, Shew, Gray, Bausch & Lomb, Gregg, Gundlach, François, "Optimus," Morrison, Darlot, Laverne, Wales and unknown persons.

Then came :

What size of detective camera do you prefer? Eleven answered, $3\frac{1}{4} \times 4\frac{1}{4}$; twenty-two, 4×5 ; two, $4\frac{1}{4} \times 5\frac{1}{2}$; one, $4\frac{1}{2} \times 6\frac{1}{2}$; one, $4\frac{3}{4} \times 6\frac{1}{2}$; two, 5×7 . Those preferring the quarter size, generally say that they do so because the dry plate it holds is the right size for making lantern slides by contact, and enlargements can be nicely made from it.

Is it necessary that the camera should be so constructed that observers' attention will not be called to it? The majority answer "No;" but it is preferable if made unobtrusive; that it is almost impossible to so construct it that people will not "catch on it;" that nothing, however, that tends to affect the simplicity of the mechanism of the camera should be sacrificed in making it inconspicuous. A number think the detective cameras of to-day sufficiently unobtrusive for all ordinary purposes, especially street work.

Which is the best way to hold the camera so that it will be steady while making an exposure? Under one of the arms, the right generally, pressed closely to the side, the hand of that arm keeping it steady, while the other hand operates the release of the shutter. Hon. Alvey A. Adey, Assistant Secretary of State, Washington (D. C.) Camera Club, says: "I rest my larger boxes on my left fore arm, not touching the body; the right hand works a bulb, and does not touch the body." Harry D. Williar, Amateur Photographic Society of Baltimore (Md.): "I have a push-button on the right hand, upper corner front, of my camera; I take a firm hold with the left hand, palm on the bottom, and steady with the thumb on the side, and then with nearly the same position of the right hand on the right side of the camera, and thumb pressing on the push-button, or handy to it, I take a firm hold with the right, and I never have a blurred negative. At one time I pressed it against my side and found at times blurred negatives." L. M. Petitdidier, Cincinnati (O.) Camera Club: "Under the right arm, with the right hand reaching under the box and one or two fingers controlling exposure by pressing a button at will. If the camera be so held, any motion communicated to it by the body will be a slow one, and for ordinary exposure there will be no movement noticeable. I never had any case of shaking in the detective camera." W. T. Wintringham, Brooklyn (N. Y.) Academy of Photography: "Resting against the right hip." William A. Bullock, Photographic Society of Philadelphia: "Under the arm, resting upon the hip. Hold your

breath when pulling the trigger. Do not rest the camera upon the stomach, and bend over it, as though you had an ache in that locality; it is not graceful, and always attracts attention." J. V. Black, Society of Amateur Photographers of New York: "I find no difficulty in holding mine perfectly steady under my right arm, pressing the spring with the thumb of my left hand, when the shutter is set at a medium speed; but for the slowest speed of the shutter, I usually hold the camera directly in front of my body, with the back against it." D. E. McComb, Washington (D. C.) Camera Club: "Pressed tightly against the breast."

Should not the camera have a swingback? For detective work it is not necessary; for view work, quite essential, is the general opinion. W. M. Butler, St. Louis (Mo.) Camera Club: "No; because this requires a small stop, and thus prevents instantaneous work." Albert H. Pitkin, Camera Club of Hartford (Conn.): "Would prefer a rising front." Charles Simpson, The Society of Amateur Photographers of New York: "Decidedly yes; and I see no reason why manufacturers have overlooked this very important feature." Major George Shorkley, U. S. A., Society of Amateur Photographers of New York: "Yes, two of them." Edgar Richards, President of Washington (D. C.) Camera Club: "Certainly, if architectural effects are to be reproduced; for landscapes, not necessary." George Marshall Allen, Society of Amateur Photographers of New York: "If it would work automatically." Walter Clark: "It is best to keep the detective as simple as possible." The following question was asked: "If a camera with a swingback is used without a tripod, is it not liable to give greater distortion than a camera without one?"

Do you think it necessary to have a finder? *Should there not be two?* *Should there not be hoods over the finders?* Four consider it needless; seven, that it is an advantage to have a finder, but not absolutely necessary; twenty-eight, that it is indispensable; nine, that one is sufficient; twenty-nine, that two are desirable. Hoods are also considered desirable. Charles Simpson: "I have two finders on my camera; a camera without any would be of no value to me; when you want to take a picture either way (vertical or horizontal), you must have a finder for each position to be sure of your field." W. M. Butler: "A finder is quite needless; if three round head screws be placed on the outside of the camera, giving the angle corresponding to the angle of view of the lens, all the purposes of the finder will be fulfilled without any of the annoyances of the usual form." A. A. Ade: "A finder is very necessary; one is sufficient, as it can be viewed as easily from the side as above; a cover, hinged and standing upright, serves as a hood." Harry D. Williar, Amateur Photographic Society of Baltimore (Md.): "I think a finder absolutely necessary, but do not see the advantage of two; but I do think that it should have a hood, as at times I find it almost impossible to get along without one, and, in fact, have concluded to put one on my box on a hinge; for, outside of its usefulness, it is a means of hiding the purposes of the box, and makes it a little more mysterious, or rather less conspicuous, to the uninitiated. I make a hood with my hands to answer the purpose until I can get the chance to make a good one on hinges." Isaac T. Norris, Amateur Photographic Society of Baltimore (Md.): "I think two finders so essential that I shall have an extra one put in; the hood I do not feel so necessary, as I make a hood of my hand." L. M. Petitdidier: "Have tried without and with finder, and emphatically pronounce in favor of finder; do not consider a hood necessary; good only to keep off dust." Edgar Richards, President of the Washington (D. C.) Camera Club: "Finders essential, and to embrace the same angle of view as the lens cuts on the plate; certainly two; hood to screen off the light an improvement." Robert Baker, Society of Amateur Photographers of New York: "Very important to have two finders; if well sunken in the box there is no need of hoods." Frederick Bruce, Society of Amateur Photographers of New York: "Only use one finder, as the other cannot be made exact; consider hoods necessary." E. Terry, Society of Amateur Photographers of New York: "Two finders necessary, and also sights." Walter Clark: "Not essential; the large finder or full plate on which to focus, I consider a powerful aid to intelligent composition and the study of nature."

Should not the detective be made solely for detective work, and not also be arranged for view work? Nine answer, for detective work only; twenty-nine, for both. Robert E. M. Bain, St. Louis (Mo.) Camera Club: "I believe that it should be arranged for detective work only." Archibald I. Carson, Photographic Section Cincinnati Society of Natural History: "If 'detective' be used in the strict sense of the term, it should not be so arranged; otherwise yes." Isaac T. Norris: "If only for detective work, many of its appliances may be abandoned; while if used for view work also, too many cannot be added." Major George Shorkley: "For detective, not tripod use, but should have a time shutter." Sydney Bishop, Society of Amateur Photographers of New York: "For the average amateur, both ways." W. T. Wintringham, Brooklyn (N. Y.) Academy of Photography: "Immateral, provided the arrangements for time pictures are not complicated." William A. Bullock: "There is no need of a tripod attachment to the camera; all that it is capable of doing can be accomplished holding it in the hands." Walter Clark: "The vest camera and others of that class are the only true detective cameras; the province of the so-called detective I consider to be the production of satisfactory pictures of moving objects or random bits of interest to tourist or pleasure-seeker, or notes for the artist, architect or engineer, to be gathered right and left with minimum of effort." William M. Murray, Society of Amateur Photographers of New York: "If the camera is as large as 4 x 5 it adds to its value to have it arranged for view work; I have used mine with a tripod for time pictures, and have made my best work with that arrangement." Miss Catharine Weed Barnes, Society of Amateur Photographers of New York: "I should not have bought a detective unless it might be used for view work."

What should be the focal length of a lens to cover with full opening the plate used? Robert E. M. Bain: "The lens should be of about 6 inches equivalent focus; and should cover the plate all over with a stop of $\frac{f}{11}$." Archibald I.

Carson: "I prefer a size larger lens than the plate used for various reasons; both for covering power and focal length." Sydney Bishop: "The lens should be one size larger than the plate, *i. e.*, a 4 x 5 for a quarter plate, etc." W. T. Wintringham: "Focal length should equal or exceed the diagonal of plate, and aperture should be as large as possible, $\frac{f}{4}$, if it can be obtained with good covering power and definition." W. M. Murray: "Not larger than 7-inch focus for a 4 x 5 plate; that gives an angle of 39 degrees; 6-inch focus would be better, covering a view of 45 degrees."

Do you prefer a rapid rectilinear or a wide-angle lens? Thirty-five, rapid rectilinear; two, wide-angle; one, both. Harry D. Williar: "For confined situations of course the wide-angle is best; but for general work give me the rapid rectilinear." Edgar Richards: "The lens for detective work is yet to be made, of an angle of view between 30 and 40 degrees." W. T. Wintringham: "The rapid rectilinear, at $\frac{f}{8}$, is a necessity, and $\frac{f}{6}$ is better; and these aper-

tures cannot be obtained in a wide-angle lens." Robert Baker: "A medium wide-angle is best." W. M. Murray: "If a wide-angle is used it should be a moderate angle, so as not to greatly distort the perspective."

Is it not an advantage to have both of these lenses, and should not all detectives be so constructed that the lens can be quickly changed? Twenty, no; fifteen, yes. A. A. Ade: "I do not think it would be an advantage to change from a rectilinear to a wide-angle lens, unless the necessary change of focal length could be effected automatically at the same time; to change one and not the other in a hurry would cause disheartening failures." Richard H. Lawrence, Society of Amateur Photographers of New York: "Yes." L. M. Petitdidier: "This would involve too much complication, and would perplex the artist, and lead him into errors and regrets; too much choice is injurious." William E. Bond, Society of Amateur Photographers of New York: "I think it would be an advantage." Edgar

Richards: "Do not see the necessity; would make construction of the camera proper more complicated, unless lenses of the same approximate focus were used; all lenses for any kind of work should have bayonet joints and fit in the same flange, within limits of course." William A. Bullock: "(a) Yes; (b) it would be a convenient arrangement." E. J. Carpenter, Cincinnati (O.) Camera Club: "The use of two lenses in a detective camera is not advisable; it is sure to confuse the operator, particularly in focusing."

How does the single lens do for this kind of work; is it rapid enough? The majority answer that they have never tried the single lens for detective work, and therefore cannot express any opinion. W. M. Butler: "No, except some high-grade lenses, like Dallmeyer's, which costs as much as a rapid rectilinear." A. A. Ade: "A good single lens works quicker and with deeper range of definition than a doublet of the same aperture." Albert H. Pitkin: "Of two lenses of equal foci and openings—one single and one double combination—the single should be the quickest if made of the same glass." F. C. Beach, Society of Amateur Photographers of New York: "Yes, with good light; but it is apt to distort somewhat." W. A. Bullock: "It will do well where there is brilliant illumination; I have taken instantaneous pictures with it at the sea-shore." E. J. Carpenter: "Single lens will answer for some kinds of work in summer."

Do you use a fixed or movable focus? Ten, fixed; twenty-eight, movable. A. A. Ade: "I use a fixed focus with all my cameras; the $4\frac{1}{4} \times 5\frac{1}{2}$ works sharp for 40 feet and beyond; the $3\frac{1}{4} \times 4\frac{1}{4}$ for 25 feet and beyond; the others still shorter range. The $4\frac{1}{4} \times 5\frac{1}{2}$ camera has a Suter Aplanat, series A, 7-inch focus; the quarter plate a Beck Rectilinear, $5\frac{1}{4}$ -inch focus." Archibald I. Carson: "Fixed focus at 18 feet; Beck Rapid Rectilinear, quarter size, 5-inch focal length." W. A. Bullock: "Both, but mostly the f of the lens." E. J. Carpenter: "Focus for every view, estimating distances 8, 10, 12, 15, 20, 30, 50 feet and distance." L. M. Pettitdier: "Movable focus I think is indispensable." W. T. Wintringham: "Movable, but seldom used except for very near work." Frederick Bruce: "Movable from 10 feet to universal focus about 100 feet." W. M. Murray: "A movable focus with 7-inch lens on a 4×5 ; but if I used a shorter focus lens I should use a fixed focus."

What diaphragm do you chiefly use in summer and in winter, the summer season being from May to November, and the winter from November to May? General

answer: In summer, $\frac{f}{16}$; in winter, $\frac{f}{8}$ to full opening. James H. Stebbins, Jr.,

Society of Amateur Photographers of New York: "Always $\frac{f}{15}$, only changing

the speed of the shutter." Sidney Bishop: "For street work the next stop to full opening, and for water the next smaller in summer; for street work full aperture, and for water the next stop in winter." W. T. Wintringham: "The

largest, varying exposure by the speed of the shutter." Frederick Bruce: " $\frac{f}{11}$

always." E. Terry: "Third, whenever I can." Miss Barnes: "Full opening."

E. J. Carpenter: "About $\frac{f}{8}$." George Marshall Allen: "Depends entirely on

conditions; no one more than another." Charles Simpson: "Summer, medium or next largest; winter, next to the largest; I never use full opening."

Which diaphragm is best to use when the object is in bright light and in shade? General answer: Bright light—summer, $\frac{f}{16}$ and $\frac{f}{22}$; in winter, $\frac{f}{8}$ and

$\frac{f}{11}$. Shade—summer, $\frac{f}{11}$ and $\frac{f}{16}$; in winter, $\frac{f}{8}$ and $\frac{f}{4}$. Of course the

diaphragm varies very much with the conditions of light, but the object of both of these questions was to ascertain the stops generally used. For marine views,

$\frac{f}{22.6}$. William J. Hickmott, Camera Club of Hartford (Conn.): "I always use the largest diaphragm I can; don't think I ever over-timed a plate very

much." Harry D. Williar: "I generally use the largest diaphragm that I consider will do the work." A lady amateur, Worcester (Mass.) Camera Club: "At the sea-shore, $\frac{f}{22.6}$; when snow is on the ground, $\frac{f}{16}$ and $\frac{f}{22.6}$."

Major George Shorkley: " $\frac{f}{16}$ in bright light, summer, otherwise $\frac{f}{11}$; I prefer to use as rapid a shutter as possible." Walter Clark: "I vary my diaphragm very seldom."

What is the principal fault of your shutter? Fourteen are satisfied with their shutters. W. M. Butler: "No definite means of regulating its speed." R. H. Lawrence: "No means of knowing its speed." Albert H. Pitkin: "No means of adjusting speed." Archibald I. Carson: "Arranged simply for instantaneous exposure." Isaac T. Norris: "To control the speed more perfectly, or at least to know its speed." Rev. E. C. Bolles: "That it gives uniform exposure of the whole field." Edgar Richards: "That the speed of exposure is not uniform, being more rapid at the beginning." W. A. Bullock: "That you can never be sure of the speed twice running the same." E. J. Carpenter: "Cannot change the speed as quickly as I would like." John Leshure, Springfield (Mass.) Camera Club: "Not quick enough."

What is the average speed of your shutter when making exposures? W. M. Butler: "Winter and summer, $\frac{1}{10}$ second." Harry D. Williar: "Generally give it slowest speed, except for marines, ice, snow, etc." L. M. Petitdidier: "From $\frac{1}{10}$ to $\frac{1}{100}$ second (?); in summer, $\frac{1}{10}$ to $\frac{1}{100}$; in winter, $\frac{1}{10}$ to $\frac{1}{20}$." Major George Shorkley: "Summer, about $\frac{1}{40}$ second; in winter, $\frac{1}{20}$." Rev. E. C. Bolles: "As fast as it will go, say $\frac{1}{10}$ second." Sydney Bishop: "As fast as it will go." Edgar Richards: "Highest tension of speed." W. T. Wintringham: "Highest speed, $\frac{1}{200}$ second; lowest, $\frac{1}{80}$." F. C. Beach: "Probably $\frac{1}{20}$ second." Walter Clark: "Prefer slow shutter." W. M. Murray: "Half-speed generally." D. E. McComb: "About $\frac{1}{50}$ second in summer; about $\frac{1}{20}$ second in winter." A. L. Simpson: "Except on the water, as slow as possible." H. M. Grisdale: "Summer, $\frac{1}{50}$ to about $\frac{1}{100}$ second; winter, as slow as it is possible to get subject still and sharp." John Leshure: "Summer, $\frac{1}{40}$ second; winter, $\frac{1}{25}$ second." The majority of the answers reply: "Don't know," and "Can't find out." The beautiful candor of this general reply, when there was such excellent opportunity to display scientific knowledge, shows that the character of the photographer is susceptible of the highest moral cultivation.

Should there not be some means of indicating the speed of the shutter? Thirty answer, "By all means;" eight, "Not necessary." A. L. Simpson: "No, as any one with experience can guess." H. M. Grisdale: "At least some means of getting the same speed as often as wanted." Charles Simpson: "Yes; that is the fault which most detective cameras have; mine has a lever which can be moved forward and back one inch, and I can accurately judge the speed of my shutter." J. V. Black: "Yes; I could record mine by number only, which would be useless for comparison." R. E. M. Bain: "Do not think it necessary; your judgment and experience should tell you what speed to use, and it takes quite a long experience to do artistic shutter work." A. A. Ade: "Yes, if reliable; but I doubt if a trustworthy indicator would show the degrees of speed above $\frac{1}{100}$ of a second." William J. Hickmott: "Don't think it would be any great advantage; detective cameras are already too complicated." L. M. Petitdidier: "Good photographs can be and are made without this means, but I think much better and more uniform results could be obtained with it." Sydney Bishop: "Yes; though I always use my shutter at full speed, and depend on development to correct any error, except in case of shade, when I slow my shutter." Edgar Richards: "A spring that is in tension constantly becomes fatigued and fails to give the same speed as at first; this is especially true of phosphor bronze; exposure at various speeds of the shutter on falling bodies, and measuring and calculating, gives the most correct results of the time of exposure and a ready means of checking off results at any time; the speed of shutter and diaphragm of lens used depends on sensitiveness of plate employed, season, time of day,

and rapidity of motion of subject, and must be modified accordingly." William A. Bullock: "Yes, there should; I consider it a much needed improvement." Walter Clark: "Not without one had some effective light gauge." E. J. Carpenter: "Desirable as a matter of curiosity."

(To be continued.)

THE TRIALS AND TRIBULATIONS OF THE PHOTOGRAPHER.

BY ABRAHAM BOGARDUS.

[Read before the Society of Amateur Photographers of New York.]

(Continued.)

A WRITER in the "Philadelphia Photographer," in 1864, in an article entitled "A Trip to Pike County," says: "A good stock of tannin plates had been exposed. The plates failed to yield much even to the most powerful agencies, and in some cases those plates which had been exposed over half an hour, after being coaxed with fuming, alkaline development, etc., gave merely the high lights. It was unanimously carried that the wet process alone should be trusted in the next attempt."

And in the May number of 1864, he says: "A short distance up the creek there is a fall in a dark corner, where the sun never penetrates. We came to the conclusion that no wet plate would remain wet long enough to give us sufficient exposure, and that it should be intrusted to the dry process. This would have necessitated the loss of several days, and it was proposed that we should wait until the railroad in contemplation, connecting the Belvidere Railroad with that valley, should be made, so that a dry plate might be exposed and left there, when we could return to the city, attend to other occupations and go back after one week or a fortnight." (Prolonged laughter.)

Charles Wager Hull, in the "Philadelphia Photographer" of February, 1867, says: "In my opinion the dry process has but one trouble, which, I much fear, will never be overcome; that is, its slowness compared with the wet."

The same writer in the same publication, in January, 1869, speaking of the experiments to make the dry plate just what they want it to be, says: "Not satisfied with experimenting with 'things' which kill and destroy life, experimenters have rushed madly into the kitchen and the butler's pantry, and seized upon tea, coffee, sugar, gelatine, ale, beer, porter, claret, and one extra ambitious chap (I have forgotten his name) took the bitters which he had purchased for his morning cock-tail, and by its use reported that his negatives were 'superb.'" (Laughter.)

In the same publication, September, 1869, Dr. Herman Vogel, in his German correspondence, says: "One of the favorite subjects of experimental photographers is the working of dry plates. How much has been written on this point! All organic and inorganic substances have been successively tried—albumen, tannin, linseed, coffee, tea, sugar, honey, molasses, beer, gum, glycerine, rosin, etc. I must confess, however, that after years of trial I have arrived at the same conclusion as my friends Remele and Braun, in Dornach. The latter told me that he had spent 15,000 francs on experiments with dry plates. It is easy to pack chemicals, apparatus and tent in the same time that it requires to prepare a single dry plate. I feel confident that the saving of labor and time is largely in favor of the 'wet process.'"

G. Wharton Simpson, in the "Philadelphia Photographer," in 1870, says: "The newest dry plate process and in many respects the most philosophical—I mean the collodio-bromide—except in a very few hands, has not been successful. As a rule, experimentalists have failed in employing this process." "And it is also the fact that some who write most dogmatically on the subject, never produce anything presentable at all. Every now and then we hear laments on the untrustworthy character of dry processes. A recent article by Herr Most, in a German journal, takes up this position and institutes a comparison between the wet and dry methods, very much to the disaragement of the latter."

I have been requested, as I said in the outset, to stick to my text. What is it? (Laughter.)

Now I will give you, with your kind permission, a few incidents as they happened day after day. It is a very easy thing to write and talk about photography, but to the man that stands under the skylight it presents a very different attitude. People may not think so, but let them try it. To see thirty and forty different people come up in the course of a day, all different faces—you are expected to make the best view of each face—a face that you never saw before and perhaps never will again, and you are expected intuitively, at a moment's notice, to make the best picture of that face—it requires an amount of brains that very few have any conception of. And you are asked unreasonable things all the time.

I remember once a lady brought three children, two boys and a girl, to my gallery. They came well armed. The little girl had a doll. There was a hobby-horse brought up, and the other boy had a gun. It was evident that the girl was to hold the doll; that was agreed; but which boy was to ride the hobby-horse? That was to be left to my superior judgment. It was not an easy thing to decide, because both wanted to mount the hobby-horse, and after I had decided it, the mother said she did not want this picture taken like all the "dog-gerotypes" were taken. She wanted the girl in the middle of the room, the boy on the hobby-horse over on the other side of the room, and the boy with the gun on the other side of the room. (Prolonged laughter.) Well, it was a very brilliant idea, but how my quarter size camera was going to reach them all, I could not tell, and I told the lady that it was impossible; and I tried to explain to her about the concentration of the light, the lenses and all that sort of thing, but she did not know anything about that; and she finally said to me that she heard I was supposed to be accommodating, and that she had been to three different places, and they all told her what I did, and she did not think that I was any better than any of the rest of them. (Laughter.)

One day a Paddy brought in a small case, and he said he wanted a life-size picture put into it. (Laughter.) It was a difficult thing in those days to make people understand the difference between a full length and a life-size, and I told him it would not hold a life-size, and then he said: "Well, then, take it with the legs hanging down." (Prolonged laughter.)

When General Logan was at my place having a sitting I remember something that occurred. The General was usually a very reserved man. It was seldom that you could get him to talk, but this time he saw on the walls a man he did not like, and he said to me: "I see that you take anybody's picture." "Oh, yes," I said, "that is my business. I don't have time to inquire into a man's private character when he comes here for a picture." "Well," he said, "I suppose you would take the devil if he would sit for a picture." And I said: "Undoubtedly we would;" and I added: "I suppose we could run off a good many down around Washington." (Laughter.) "Yes," he said, "that is the place to sell them."

A man came to me one day. He did not like his picture. Oh, how many didn't like them! (Laughter.) He said to me: "My picture looks like the devil." "Well," said I, "I could not say, for I never had a sight at that individual; but sometimes a resemblance will run all through families." (Laughter.)

One morning a lady came into my place, who had two other ladies with her; she ran up to the counter and said: "My picture is twenty years too old; I won't have it, and I want to sit again." The man at the desk passed her right up-stairs as soon as possible for another sitting, and as she was passing up one of the ladies said in an undertone: "Ugly old thing, she looks exactly like it; she only wants to try another dress." (Laughter.)

There is another incident that I wish to mention right here before I forget it. It is something that never came under my experience, but I heard of it. The man, in pointing his camera at the sitter, knocked it a little one side, and instead of having the picture in the middle of the plate he got the man away off in the corner, and afterwards scolded the man because he did not sit in the middle. (Laughter.)

Another old lady came in one day and said she wanted her picture "front face, but a little three-cornered." (Laughter.)

I recollect one day two ladies bringing in their mother. A sitting then required thirty seconds. We had a side screen, and after the great deal of preliminaries and the daughters' fixing the old lady's cap in a way that they thought would be the most becoming, I raised the cloth and stepped behind the screen, so that she could not see me, because I did not want to disturb her, and at the expiration of the thirty seconds I emerged from behind the screen and went to the camera and found the old lady looking out the window. (Laughter.)

Here is another one. I wish you could have seen it. A very fine looking girl came in with a diminutive specimen of an escort, for a picture, and after I had arranged the position and got my camera all ready, she said to me: "Where must I look?" This little fellow jumped out from behind the screen—he was fully three feet high—and cried out: "Look at me!" and the young lady commenced laughing and we could not make a sitting of her. (Laughter.)

Another time an old lady was in the chair—we sat her about thirty seconds I think; when it was about half over I heard some talking in behind there, looked, and she was motioning with her hands and crying out, "Stop it, stop it! I winked." (Laughter.)

Dr. Tyng, the old gentleman, was sitting one day and I said to him, "Doctor, I have now made some sittings front face; now I wish you would turn to the left, because I would like to take some side views." And he turned around and said: "Mr. Bogardus, I am an upright man, and I would not turn to the right or to the left for any one." (Laughter.)

Then we have had some sad scenes. I remember one day a German woman came in with a bundle and commenced to unroll it, and after she unrolled it I found it was her dead baby. She brought it there to have a picture taken. So that with all the hilarity, as we call it, we have some sad scenes now and then in the practice of the art.

There was a very singular remark made to me once in my gallery by a Judge who was sitting for a picture, and the gentleman who accompanied the Judge there that day said: "Now, Judge, look dignified. Look just as you did the last time you sentenced a man to be hanged," and the Judge said, "I don't know about that, for that man was reprieved." (Laughter.)

But in my experience in the profession, I have learned a good many things, and one of the things I have learned is that stout people always want to look thin and thin people always want to look stout. The older ones don't want the wrinkles to show, and they all want to look a little younger. Many and many a time old ladies have come up to me and would ask me if I could take their picture without showing the wrinkles. "Yes," I would say, "but where will the likeness be?"

A photographer is said not to have any mercy. I remember once a certain Judge came with his wife to have a picture taken. The Judge was suited with his picture, but when we showed the lady her picture she doubted whether she had quite so many wrinkles; and he straightened himself up and said: "My dear, if you had wanted a handsome one you ought to have commenced thirty years ago." That settled it. I did not have to say another word.

But there were sometimes very laughable scenes in my gallery. I received one time I guess as many as three different letters from a person whom I had never seen—she was a lady; she wanted to sit for a picture. She had been so unfortunate; she had tried here and there to have a satisfactory picture of herself and they were all "horrid." Well, of course I had my misgiving about the matter. What the trouble was I could not tell exactly. So I felt very anxious to see her come on the appointed day. A private carriage rolled up to the door, and the dressing maid jumped out and brought all the paraphernalia in. I suppose she weighed at least 250 pounds, was gorgeously decked out in a low-necked dress, skin very nearly the color of a lobster, and was very particular to tell me that she had had so many bad ones taken of herself. I made up my mind that, with the material I saw before me, it would be a pretty difficult job to suit

her, and so, sure enough, after I made the picture she agreed with me exactly, "that it did look horrid." (Laughter.) I did not have to say any more. I never got any pay for that picture.

In conclusion I would say, young gentlemen, I am glad to meet you. I am glad there are efforts being made to elevate photography, because I have a high idea of it myself, and I believe it is yet undeveloped. The possibilities of photography are still unknown to us. There are more secrets in it than we have ever solved. People think it is about exhausted, but I think there is a future to it, and I think somebody, with patience, study and experimenting, will bring that future out.

To all interested I say, study well, delve deeply into this great mystery, and some mind will yet evolve from photography results that will cause mankind to look with wonder and astonishment; and, as I have said elsewhere, some name will go ringing down the ages as having added to the pleasures and requisites of man, and, crowned with the applause of his fellows, his fame shall last as long as time and light continue. (Prolonged applause.)

A MINIATURE DETECTIVE CAMERA.

LATELY there has appeared from the factories of our publishers another addition to the already large army of detective cameras. As this is of more than ordinary interest, and a step in the direction of what we conceive to be the true detective (we hate this word) or hand camera, we shall devote a portion of our space to its illustration, and a description of the results obtained with it.

In the first place, the entire apparatus is only 4 x 4 x 6 inches, and looks, with the carrying strap across the shoulder of the photographer, something like the leather case of a field glass. Owing to its small size it has been called, "The Lilliput," and has the appearance indicated in Figure 1.

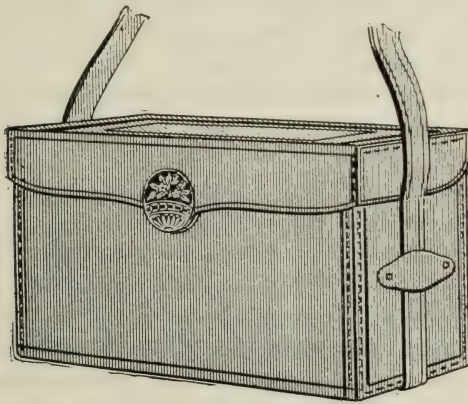


FIG. 1.

The interior of the case contains a camera with a lens of fixed (universal) focus; it is therefore unnecessary to make any change of focus to suit objects at varying distances, a great disadvantage in hand cameras of the ordinary construction. The plate holders carry dry plates $2\frac{1}{4}$ inches square and a picture of this size can be obtained; but there is supplied with the camera a cut-out which gives a circular picture about $2\frac{1}{4}$ inches in diameter, a very convenient size and form for making lantern slides. Six plate holders, carrying twelve dry plates, are contained within the case, into which they fit closely, and are kept in focus by a spring. As each plate is exposed (by drawing a slide and releasing the shutter as usual) the holder is removed to the rear of the box and squeezing it into its

place forces a second holder into focus for the next shot. Fig. 2, giving a sectional view of the interior of the camera, will show this construction; the rings exhibited serve to lift out the plate-holders.

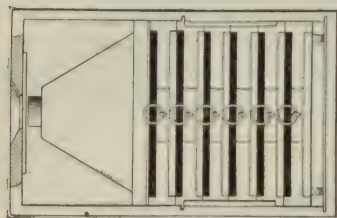


FIG. 2.



FIG. 3.

The plate holders are of the usual construction, and by a very simple arrangement of different colored slides the number of plates exposed can always be ascertained.

The shutter is very simple and effective, and admits of both time and instantaneous exposures.

The working of the camera is simplicity itself. The first step is to set the shutter (time or instantaneous at will); second, revolve the leather tablet that covers the lens on the outside of the box (see Fig. 3); third, draw the slide of plate holder; fourth, release the shutter, and the picture is taken. If a time picture is desired, after releasing the shutter it is closed by touching another spring. Having made the exposure, replace the slide in plate holder, remove it to the back of the case, when another plate is forced into position for a second shot.

One great advantage of this little instrument is that it uses dry plates, and you can develop the negatives yourself if desirable, or it can be done by others who know how to use plates. The results are particularly good in almost every instance, far more so than with ordinary hand cameras. The negatives are small in size, but they make excellent lantern slides, and are so sharp that enlargements six or eight times make beautiful pictures on bromide paper. We know of no instrument of like compactness that gives such good results. We have seen it used by a lady who never before took a negative of any kind, and the results obtained were as good as those obtained by others of considerable experience. The whole affair is remarkably cheap, when we consider the ingenuity and care displayed in its construction. We think that summer tourists of both sexes will have "lots of fun" if they will carry one of these little cameras with them on their rambles.

OUR ILLUSTRATION.

THE handsome portrait of President Benjamin Harrison, with which we illustrate this issue of the BULLETIN, is from a negative by Mr. W. H. Potter, the well known Indianapolis photographer. It has been reproduced in photo-gravure in a very perfect manner, and gives an excellent and life-like impression

of the new President. Mr. Potter's work is always artistic, and the frontispiece of our journal is fully up to his high standard. *The picture is copyrighted by W. H. Potter.*

FIRST ANNUAL EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF CHICAGO, TO BE HELD IN MAY, 1889.

PROGRAMME.

THE first International Exhibition held by the Photographic Society of Chicago will be open to all photographers, foreign or American, and will be held in Chicago during the month of May, 1889, probably at the Art Institute.

The object of the exhibition is for the promotion of the art science and technical excellence of photography.

RULES AND REGULATIONS GOVERNING THE EXHIBITION.

The exhibition to be held in Chicago and last two weeks.

The important details of the exhibition shall be in charge of a Committee of Arrangements, appointed by the executive officers of the society, and shall consist of not less than three.

At the annual exhibition Diplomas and other prizes will be awarded by a Board of Judges to be selected in a fair and impartial manner.

The number of awards to be made at the exhibition will be decided upon by the judges, according to the number of exhibitors and the merit of the exhibits.

All photographers, professional or amateurs, are at liberty to compete for prizes. They must become active or associate members of the Photographic Society of Chicago in order to qualify for such competition.

Entries for all exhibits must be made to the Secretary before the 15th of April. No exhibitor will be allowed to put on the front of the exhibit anything except the title and exhibitor's name.

All pictures to be sent at owner's risk. The society will not be responsible for any damage that may occur to exhibits forwarded, but will use all reasonable care to protect them.

After the exhibition, which will last two weeks, the exhibits will be repacked and returned to the exhibitors.

CLASSIFICATION OF PRIZES.

Class A.—Portraits and genre pictures by professionals.

Class B.—No. 1. Portraits and genre pictures by amateurs who complete the picture. This includes composition, exposure, developing, printing, toning, etc.

Class B.—No. 2. The same as B. No. 1, by amateurs who do not complete their picture, but includes composition and exposure.

Class C.—Landscape and Marine Photography.

No. 1. By Professionals.

No. 2. By amateurs, same as in Class B. No. 1.

No. 3. By amateurs; same as in Class B. No. 2.

Class D.—Flash-light photography.

No. 1. Portraits and genre by professionals.

No. 2. Portraits and genre by amateurs, conditions same as Class B. No. 1.

No. 3. Portraits and genre by amateurs, conditions same as Class B. No. 2.

Class E.—Detective camera work.

Class F.—Instantaneous photographs.

Class G.—Animals.

Class H.—Kodak.

Class I.—Transparencies.

No. 1. For window.

No. 2. Lantern slides.

Class J.—Photo-micrography.

Class K.—The best negatives on celluloid films.

No. 1. Instantaneous.

No. 2. Time exposures.

Class L.—Platinum prints.

No. 1. Black.

No. 2. Sepia.

Class M.—Best prints on linen, silk, or any fabric.

Class N.—Bromide enlargement done by exhibitor.

Class O.—Bromide prints contact.

No. 1. By professionals.

No. 2. Amateurs, conditions as in No. 1 B.

Class P.—Photo zinc etching for newspaper—best collection done by staff of paper exhibiting.

Class Q.—Photography pertaining to the profession of the law.

Class R.—Celestial photography.

Class S.—Exhibit pertaining to medico-photography.

Class T.—Exhibit of prison and police photography.

Class U.—Exhibit of photo-mechanical printing process.

Class V.—Exhibits of ortho-chromatic photography.

Class W.—Exhibits of photographs in competition for prizes other than those given by Society.

PRIZES OTHER THAN THOSE GIVEN BY THE ASSOCIATION.

Already several manufacturers and dealers wishing to encourage the exhibition have generously offered prizes.

The Smith & Harrison Dry Plate Co. will give one prize of \$50 in gold and another of \$25 in gold also.

The Harvard Dry Plate Co., of Cambridge, Mass., will give valuable prizes.

The Blair Camera Co. have promised a prize of the value not less than \$50.

Gayton A. Douglass & Co. offer a Laverne ortho-panactinic lens with Iris diaphragm and Laverne shutter for 5 x 8 plate, value \$48, for best collection of 12 platinum prints.

Sweet, Wallach & Co., of Chicago, offer one 8 x 10 imperial lens for the best display on the McGowan Dry Ferrototype Plate.

The Eastman Dry Plate & Film Co. will donate a Kodak camera complete, to be given as a prize for the best collection of not less than 25 Kodak pictures.

N. C. Thayer & Co. will give a prize.

Associate members (non-resident); this will entitle any one to compete for prizes to be awarded by the society; the fee is \$3.

To compete for all prizes awarded by the society and others, the fee will be \$5.

Pictures from abroad can be sent unmounted.

It is expected that an addition will be made to this list of prizes, as several more have been promised.

Any photographer wishing to exhibit and not compete for prizes or diplomas can do so free of charge, if the exhibit is considered of sufficient merit by committee in charge.

JUDGE J. B. BRADWELL,
President.

Prof. G. W. HOUGH,
1st Vice-President.

G. F. CHARLES,
2d Vice-President.

GAYTON A. DOUGLASS,
Treasurer.

C. GENTILE,
Secretary.

M. J. STEFFENS,
FRANK A. PLACE,
H. D. GARRISON, M.D.,
Executive Committee.

SECRETARY'S OFFICE,
134 Van Buren Street.

All exhibits entrusted to our care will receive our attention, and we will have them handed to the committee in charge.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.**
and a corps of practical assistants.

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Edition *without illustrations*, \$1.00 less per annum.

— ADVERTISING * RATES —

1 Page, per issue ... \$15.00.	1/2 Page, per issue... \$8.00
1/4 " " " " " 5.00.	1/8 " " " " " 3.00.
Discount on six issues	10 per Cent.
" " twelve issues	15 " "
" " twenty-four issues	25 " "

No discount on less than six issues.

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Special Notices, 25 cents per (nonpareil) line for each insertion, payable in advance.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

LYNN CAMERA CLUB.

THE Lynn Camera Club held a special meeting Tuesday evening, at which President Drew demonstrated the following ammonia process for making emulsion and coating of dry plates.

There are two kinds of gelatine used in making this emulsion, the soft and the hard; for the former Nelson's No. 1 photographic gelatine may be used, and for the latter Heinrich's. Both are cut into small pieces before using, for ease of weighing and in order that it may dissolve more readily.

Weigh out 5 grains of Nelson's No. 1 gelatine, and put it in 4 drachms or 1/2 ounce of distilled water, and add 30 grains of ammonium bromide. Ordinary tap water should not be used in the process of making an emulsion, as the successful making of it depends upon extreme cleanliness throughout, and tap water contains more or less mineral and earthy matter. Let the gelatine swell about forty minutes. The dissolving of the gelatine should not be hastened by heat, as that is apt to make it difficult to manage. Now take 30 grains of hard gelatine (Heinrich's) and place it in

just enough water to cover it. In a separate receptacle dissolve 40 grains of nitrate of silver in 4 drachms of water. The operations up to this point may be conducted in white light, but the rest must be performed with red light only. Bear in mind that the smallest amount of water possible should be used in all operations.

The next operation is emulsifying. If the hard gelatine is not yet dissolved it may be heated up to 120 degrees F., but the emulsion must never reach a higher temperature than 100 degrees F. The silver in the four-drachm silver solution is now precipitated by adding, a drop at a time, a solution of strong ammonia, until the silver is all precipitated, which is indicated by the solution assuming a dark brown color. More ammonia is now added slowly until this precipitate is redissolved. It is well to allow the contents to be exposed to the air a few minutes so that any excess of ammonia can evaporate. It should only have a faint odor, if any. This solution is now added in very small quantities, a drop at a time at the start, to the soft gelatine solution, the bottle being thoroughly shaken all the time. The thorough shaking while this operation is progressing, and the careful addition of minute quantities of the silver solution, especially at the start, are important factors of success. Now add the Heinrich's gelatine, which should have a temperature of about 80 degrees F. After being thoroughly mixed the emulsion is poured out into a dish and put away to cool and set.

The emulsion is next strained through a coarse mesh cloth, such as "railroad canvas," into a dish of cold water, and washed, this operation being repeated six or seven times. A small sieve is necessary here to recover the emulsion from the washing dish. Care should be exercised to keep the hands from contact with the emulsion as much as possible, to prevent contamination of the product, and the temperature must be kept low, about 50 degrees F. The washing should occupy from fifteen to twenty minutes, and six to eight changes of water are necessary. This washing removes all the uncombined salts and should be performed thoroughly. After the last washing add a small amount of alcohol to the emulsion and allow it to stand about ten minutes. Redissolve the emulsion at 100 degrees F. and set it away to "ripen," which will occupy a period of about three or four days. The emulsion must, of course, be inaccessible to dust or dirt.

After the emulsion has ripened it is redis-

solved at 100 degrees F. and enough gelatine added to give the requisite body for flowing on the glass plates. With the quantity used in this case we should add from 12 to 18 grains, the gelatine (Nelson's No. 1) being first dissolved in the least possible amount of water. After the emulsion has "ripened" the plates may be flowed.

Level a marble slab (a plate glass or heavy metal plate may be used instead, the object being to obtain a perfectly even surface, whose temperature will not change readily), having previously cooled it in water to about 40 or 50 degrees F. The glass plates, with their surfaces perfectly cleaned, should now be coated with the emulsion. It is well not to polish the plate, as it will be difficult to wet it with the emulsion. A good plan is to wash the plates in a bath of water to which has been added some alkali, such as soda or potash, wash in slightly acidulated water to neutralize any alkali adhering to the plate, and dip in alcohol and dry without rubbing the surface. The emulsion can be drawn over the surface of the glass plate by a small glass rod. The plate is now placed upon the cold slab or plate to set, which occurs in a few moments, and is then placed in the dark closet to dry. An improvised closet may readily be made from any old box of suitable dimensions. False bottoms and tops are inserted, so that a current of air is compelled to pass through long S shaped compartments before reaching and after leaving the plates. This is done to prevent the entrance of any light, and to this end also the whole box is covered with a dead black wash, such as a lampblack solution, so that all light is absorbed and no reflection can take place which might fog the plates.

The demonstration was quite a long one, and some of the members and visitors were obliged to leave before the finish, but those who remained were well paid by seeing so interesting a process. The President showed a negative made on a plate that was coated with some of the emulsion used in the last part of the demonstration, and it was a very fine one, showing the possibilities of the process.

J. W. GIBBONEY, *Secretary*.

PROVIDENCE CAMERA CLUB.

THE annual meeting of the Club was held March 2d, President FULLER in the chair. The committee appointed to procure a charter for the Club presented a copy of the act passed by the General Assembly February 8th, incorporating the Club, and it was accepted by a unanimous vote.

The Executive Committee reported on the lantern slide exhibition illustrating Narragansett Bay, showing it to have been a photographic and financial success. The slides for this exhibition being owned by different members, the Executive Committee were instructed to secure the slides for the use of the Club to place in the proposed Lantern Slide Exchange or to let for the benefit of the Club.

The committee on proposed exchange of lantern slides between New England clubs reported favorable action by two clubs, and communications from officers of five other clubs showing considerable interest in the matter and stating that their clubs would undoubtedly be in favor of the exchange.

Upon a vote the Chair appointed a committee of three to revise the Constitution and By-Laws of the Club.

The annual reports of the President, Secretary and Treasurer showed good progress and a prosperous condition.

The following officers and committees were elected for the ensuing year, and six applicants were elected to active membership: President, R. C. Fuller; Vice-President, L. L. Anderström; Secretary and Treasurer, J. E. Davison; Librarian, A. B. Ladd.

Executive Committee: President and Secretary *ex-officio*, C. R. Ferris, H. J. Reynolds, L. L. Anderström, B. Smith. Room Committee: R. C. Fuller, B. Smith, E. Q. Gladding.

After discussing the annual exhibition of photographs to be held at the opening of the Club's new rooms about April 15th, and passing a vote of thanks to the publishers of photographic publications for periodicals and books received during the past year, the meeting adjourned. J. E. DAVISON,

Secretary.

NEW ROOMS OF THE AMATEUR PHOTOGRAPHERS.

HIGH up in the new Swarts building now going up on the site of the old Theatre Comique, in the fourth floor, and even higher, upon the very roof, the Providence Camera Club will have its new quarters. Mr. Swarts, who is himself an amateur photographer, has had rooms fitted up especially with reference to the needs of amateur users of the camera, and when the building is completed the Club will move into the best accommodations that the amateur craft possesses in New England. The main room will be upon the corner and lighted with three large windows. The cross

Light thus obtained will be an invaluable thing in the outset to portrait photographers. But meetings and gatherings will be chiefly accommodated by this apartment, which is of ample dimensions for the Club and its friends at present. Electric lights will light it, and the connections are so arranged, all at one end of the room, that when exhibitions of lantern slides are given the operator of the magic lantern can turn the oxy-hydrogen flame on with one hand and the electric light off with the other at the same moment.

But what the camerists will value most highly is the development room. Through one door into a little passageway, and then through another door, the sacred precincts of the dark room are gained, and just at this point will come one of the most valuable details in the new arrangements. The dark room must be dark; and to keep it from the entrance of light with unwary visitors, these two doors will be connected with a newly devised, electrically operated interlocking apparatus, such that when one is opened the other is locked, and both cannot be opened at the same time. Inside the dark room there will chiefly be an immense sink, accommodating five or six photographers engaged in "developing" at the same time, with ample supplies of running water and provisions for needed chemicals in great variety. There, too, each member will have his own locker. Light will be obtained through colored glass set just above the sink, behind which shine electric lights placed in the small passageway above mentioned. The window will be blank, except for a small aperture arranged for enlarging and reducing cameras, which will be further provided for by a long table in the middle of the room.

Up in a little look-out built atop of the roof is the printing room, closed in on three sides with sloping ground-glass windows. Upon the under sides of these the printing frames can be fastened, and the peculiar soft effect of printing under ground glass obtained if desired; or if the printer chooses, the ordinary full sunlight lies outside waiting for him to raise the window and use it. Being so high, this room has all the light that the heavens can offer, and there is scarcely a possibility that the sun's direct rays will ever be shut off from it in any degree by adjacent buildings. There, too, is the fine outlook over the buildings to the river, the masts of the vessels, the thin streak of water, fair enough at that distance, the smoke and steam of the coal pockets and their picturesque masses, and the rising

slope of hill and house-top and church steeple upon the East Side—a view to keep some aspect of the picturesque always in the eye of the amateurs.

There is little that could be desired for the needs of amateur photography that will not be here afforded; for the special construction that Mr. Swarts has had in view for his friends of the Camera Club will assure this. They have no quarters at present, their rather insufficient ones upon North Main street having been given up some time ago. There are now upwards of forty members, and the Club has given token of its having come to stay by getting incorporated a few days since by the Legislature. Of the 200 or more amateurs now at work in Providence, the Camera Club includes a comparatively small proportion; but when it enters upon the possession of its promised luxuries, it will doubtless tempt a goodly number in addition to share these advantages with it.

CASE SCHOOL (CLEVELAND) CAMERA CLUB.

At the regular meeting of the Club Friday afternoon, March 8th, Mr. W. Williams was elected an active member. On motion of Professor Smith the Committee on Demonstrations was instructed to appoint a member each month to read before the Club such articles in the photographic journals as he would deem interesting and instructive. After discussing the different modes of making lantern slides and the sensitizing of exposed dry plates by immersing them in a bath of bichromate of potash, the meeting adjourned. At the next meeting Professor A. W. Smith will give a demonstration of the developing of a negative of the members of the society with hydroquinone, for the benefit of the uninitiated.

MILTON B. PUNNETT,

Secretary.

AMERICAN INSTITUTE. — PHOTOGRAPHIC SECTION.

CLINTON HALL,

19 ASTOR PLACE, NEW YORK.

REGULAR MEETING, MARCH 5, 1889.

President NEWTON in the chair.

The *Secretary* reported he had duly received for the section the usual photographic papers and journals monthly contributed to the Institute.

The Chairman of the Executive Committee announced as the subject of the evening, "The Early Days of Photography," and then

read the following papers. The first, written by Alexander Beckers; the second, by J. B. Gardner. See next BULLETIN.

The *President* then introduced Mr. Abraham Bogardus, who read a paper entitled "Fifty years of Light—Fifty years of Practice—What are the results?" after which a paper was read by Mr. O. G. Mason. This was followed by speeches by H. J. Newton and Dr. P. H. Van der Weyde, the last named presenting to the section a complete set of daguerreotype apparatus and some few examples of daguerreotypes taken by himself as early as 1840. A special vote of thanks was tendered to the Doctor for so rare and valuable a gift.

Notice was then given of the informal meeting, March 20th, and the section, on motion, adjourned.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, FEBRUARY 12, 1889.

(Continued.)

A notice not given on the programmes sent out is the following:

"About the latter part of March there will be a ladies' meeting, at which papers on photographic subjects by ladies will be read, prints and lantern slides by ladies shown, lady singers and musicians will entertain us, and we hope to have a lady chairman of the meeting. On this occasion what is termed 'Photographic Fancy Work' will be exhibited, and any member who may have photographs on fabrics, china, wood, etc., and will loan them for exhibition at this meeting, will please communicate with Mr. Duffield."

You will notice hung up on the wall the prize pictures of the first annual exhibition of the Springfield Camera Club, a testimonial of the interest taken in that society by the representatives of this society.

"The Demonstration of the Ferrotypes Process," by Mr. Griswold, is unavoidably postponed on account of his illness.

There is next a paper on "Lantern Slide Mat Cutters," by Mr. Joseph P. Beach, which I have been requested to read. See next BULLETIN.

At its conclusion Mr. F. C. Beach exhibited models of the steel mat cutters and sketches, showing the process of manufacture in full. The accompanying cuts made from the sketches fully explain the method of working.

Mr. Beach also exhibited the new Queen-shutter invented by Mr. Frank Burrows. He stated that it consisted of two concentric

crescent-shaped disks overlapping each other at the centre slightly, placed in a thin case between the lenses. They had an open and close movement, and were actuated by a spiral spring and lever on the outside, being released by a trigger operated either by hand or by a regular pneumatic piston. By moving a little cam the shutters could be held open for a time exposure.

The *President*—Mr. David Williams, one of our most prominent members, has been experimenting with film carriers or holders, and he has something to offer us which I am sure will be practical.

Mr. WILLIAMS—*Mr. President, Ladies and Gentlemen:* A film carrier is a thing to which I object most decidedly. I have seen several forms made by different manufacturers, but I do not find any of them convenient to use with a stiff celluloid film, $6\frac{1}{2} \times 8\frac{1}{2}$ inches, on which most of my work is done. I believe that the holder of the future for celluloid, paper or any other similar films, is one of what may be called the book-form, in which the film may be laid face down, being kept in place by the fingers of one hand while the other side of the holder is turned down upon it. With this feeling I applied to Mr. Barnett as the person most likely to produce what I wanted, and induced him to make some modifications in his regular holder, which adapt it to the use of films. Some of you, perhaps all, know that Mr. Barnett's holder consists of two sides hinged together and clasped when closed at the edge opposite the hinge, one side being stiffened by a small frame of wood, and the other by turning up the edge of the pasteboard of which it is formed, thus gaining both stiffness and security against light.

One modification which Mr. Barnett has made is in putting this wooden frame on the other side of his holder, so that you can lay your film face down within the recess formed by it, and the frame of wood on the other side being made smaller than usual, fits inside of the first frame, clamping down the film securely in its place. I may say here that one great difficulty in handling celluloid films of the size I speak of is in the curvature or twist which all that I have seen have, and as the sensitive surface is always on the concave side, it is very difficult to place them in any holder or carrier which requires you to handle them with the sensitive side exposed. With the holders of which I am speaking there is no necessity of touching the fingers to the sensitive side, and the operation of putting them in and taking them out is about as easy as in the

case of glass. Mr. Barnett is also experimenting on another plan, which I suggested to him, of making the recess on the front or slide side of his holder by a strip of brass, so placed that the frame of wood which stiffens the opposite side of the holder will close outside and around it, and which would be sufficiently high to hold a plate of glass. This holder would be equally convenient for either glass or films. The only difference in the operation of loading being that when a film is used it would be necessary to back it up with a piece of cardboard or other material to make up the thickness of the glass.

My dislike to the use of carriers is on account of the vexatious handling required. It is my practice usually to load say two dozen holders at a time, an operation which at the best, including the unloading and disposition of the exposed plates, occupies at the very least an hour. If the films have in addition to be put in carriers, the time required will be much greater, besides the danger of handling the sensitive surface. My experiments lead me to believe that in consequence of the absence of halation, the various films which are competing with glass will certainly take its place so far as landscape and ordinary amateur work is concerned, and I make this brief report of my own small experience as possibly assisting others who are looking in the same direction.

Mr. SIMPSON—They are single holders, are they not?

Mr. WILLIAMS—Yes, single holders. Mr. Barnett has been experimenting with double holders. The double holder involves a carrier, in his system, which shall have an arrangement for putting the film on either side of the cardboard, and then this cardboard is to act as a protector, preventing the light from passing through from one film to the other, and I think that can be made.

The *President*—I am much obliged to Mr. Williams for bringing up the subject in this way, and I hope it will be productive of a good holder.

A *Member*—I have used the ordinary Eastman film with the ordinary Barnett holder without any carrier of any kind, and have never been successful with it (that is, the holder).

The *President*—That shows already that our remarks are bearing fruit.

Is there anybody else that has anything to say in regard to the matter? If not, I will read a paper which has been very kindly sent in by Mr. Bachrach, of Baltimore. It seems that the reading and publication of a former paper

through the medium of this society has got him into trouble; at least, he says he has had so much correspondence in regard to it, that he feels called upon, in self-defense, to give a statement in the same public way in which he gave the first one. See next BULLETIN.

The *President*—Mr. Beach has a paper on the effect of Electricity on dry plates, which subject I am sure he is fully competent to handle. Mr. Beach thinks that he had better save the paper for the next meeting. Our meeting has already about run the limits.

Mr. SIMPSON—In regard to the delegate of this society to the American Lantern Slide Interchange, I want to say that Mr. F. C. Beach has given universal satisfaction as our delegate heretofore, and he is better posted than any man in the society on the matter of the Interchange, and I propose his nomination as a delegate to the Lantern Slide Interchange for the year.

Motion seconded and carried.

The *President*—If there is no other business to come before the meeting, it will stand adjourned.

[Just after the close of the meeting Mr. Colt lighted his lantern, and a few slides were thrown on the screen. A very uniform screen or disc was obtained and many of the slides appeared to good advantage. He kindly presented the lamp used in the lantern to the society, and was accorded a hearty vote of thanks by those present, for his kindness and generosity.]

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the society was held Wednesday evening, March 6, 1889, with the *President*, Mr. FREDERIC GRAFF, in the chair.

The Secretary reported the death of Mr. Emlen Cresson, an active member of the society, which occurred suddenly on the 2d inst.

He also reported the presentation to the society, by Mr. Frederic E. Ives, the author, of a copy of "A New Principle in Heliochromy," and by Mr. Edward T. Wilder, of Boston, of a pamphlet entitled "The Dawn of Photography," by William T. Brigham, both of which were received with a vote of thanks.

Exhibition circulars, etc., were received from the Columbia College Amateur Photographic Society, the Montreal Amateur Photographic Club, and the International Photographic Festival and Exhibition, to be held in London, England, during March.

The Executive Committee presented a report proposing a plan for the selection annually, by vote of the members, of four "Honor Pictures." The pictures submitted for this purpose to be exhibited in the room of the society during the month of December in each year, and to be from negatives made within eighteen months of the date of this exhibition. Each member to have one vote for four pictures, without restriction as to the number to be selected from the work of any one exhibitor. The report was accepted, and the proposed plan adopted.

The Committee on Lantern Slides made the following report:

Your Committee on Lantern Slides begs leave to report that at the Conversational Meeting, February 19th, the slides of the Philadelphia Amateur Photographic Club were shown. The committee venture to express the opinion that these slides were the best of the interchange series presented this season, both technically and artistically. Subsequently, slides were shown by George B. Wood, R. T. Hazzard, Robert S. Redfield, F. T. Fassitt, David Pepper, F. G. Rosengarten, O. D. Wilkinson, William H. Rau, C. P. Sinnikson and John A. Schulz.

The Manager of the American Lantern Slide Interchange has notified us that the English slides have arrived from London and will be here during the Joint Exhibition.

Several gifts of slides have been received, of which report will be made.

WILLIAM H. RAU,

FRANK BEMENT,

EDMUND STIRLING,

Committee.

The Committee on Joint Exhibition reported that responses from the foreign edition of circulars were beginning to come in, and a fine series of yacht studies by Messrs. G. West & Sons of South Sea, England, and also some pictures from Russia and Germany, had already arrived. Other foreign exhibits from distinguished English photographers were in prospect. The interest displayed by photographers in all parts of this country, not members of either of the three societies, was quite gratifying, many having expressed their intention of exhibiting.

Members, and other intending exhibitors, were reminded of the near approach of March 25th, the date fixed when all exhibits and entry forms must be in the hands of the committee. The committee being entirely dependent upon the applications for entry blanks as a means of knowing what exhibits can be

depended upon, it was urged that every *intending exhibitor* notify the committee of his intention at the *earliest possible date*, and also that exhibits be delivered as promptly as they can be made ready, so that the inevitable rush of work at the last moment be relieved as much as possible.

The Committee on Membership reported the election of the following active members: George B. Philipps, Dr. William M. Sweet, James Laurence Dillon, Emlen L. Carolus.

A letter was read from Mr. W. E. Barrows, a member of the society, as follows:

ROBERT S. REDFIELD, Esq., *Secretary.*

Dear Sir,—Having occasion to use hyposulphite of soda for precipitation where freeness of foreign matter was important, we filtered fifteen pounds of that article through the accompanying filter. The hyposulphite of soda was purchased for photographic purposes from a manufacturer of established reputation in Philadelphia.

Query: How many good pictures have been spoiled by the dirt in hyposulphite of soda?

Very truly yours,

W. E. BARROWS.

PHILADELPHIA, PA., February 20, 1889.

Accompanying the letter was a piece of filtering paper containing a large amount of "foreign matter," which had been filtered out of the solution.

The condition of the filter seemed to indicate that Schuylkill water in its *most natural state* had been used either in the original preparation of the hyposulphite of soda or in the solution which had been filtered. How far such impurities could affect photographic operations was not discussed.

Mr. Theodore H. Luders read a paper on the treatment of windows in connection with interior work, recommending the use of flash-light compounds for obtaining the view beyond the windows, as well as the interior itself.

WINDOWS.

Any one who has made photographs of interiors has doubtless taken more or less interest in the window question, and tried in various ways to overcome the great difference in time of exposure necessary for the windows and the interior part of the room.

These ways include shading and closing windows, inside and out—the local use of restrainers in development, and of vignetting in printing, etc.

Wishing to try an experiment in developing and having no plate exposed, I set up a small

camera opposite a window when it was almost dark, and left it for ten or fifteen minutes while I prepared my developer.

When the plate was developed I found an image of the window sash, curtains and shutters, and also of the trees and houses on the opposite side of the street, but nothing of the inside of the room. This suggested the possibility of getting a picture of the interior with the view outside on the same plate, and the flash-light seemed the thing to do it with.

The exposure by flash-light may be done at the same time as the other if the lens will permit, or if it is not desired to have the outside in focus, or it can be done after dark with a different stop, and so have the whole picture sharp.

The mode I found successful was to focus with the stop I intended to use for the flash, bringing the interior sharp, then inserting a small stop, and giving a suitable exposure for the outside about the same as if I was working out-of doors—rather a full than an under exposure, preferably late in the afternoon, even after sunset; then capping my lens I inserted the large stop and left the camera closed till it was quite dark, when I uncapped it and fired my flash powder.

The usual development seemed all right, and the result may be judged by negatives and prints shown.

In the "British Journal Almanac," 1889, there is a somewhat similar method described by an Australian correspondent, who uses, instead of flash-light, ordinary gas with long exposure.

Much might be said about the desirability of having in and outside both in focus at the same time, but that is a matter for individual taste and circumstances to decide.

I think any one who cares to try this experiment will find it quite interesting, and another pleasure added to the many that photography gives us.

THEODORE H. LUDERS.

Dr. Reed showed a film carrier, designed for use with Carbutt films, which had been brought to the meeting by Dr. Hollingsworth, a visitor, who had designed it.

Mr. Earle showed a flash-light devised by Mr. Edward M. Pim, a member of the society. The flame was produced by a coil of wick about two inches in diameter, which was saturated with alcohol. Tubes of glass about two inches long, corked at each end, were loaded with about ten grains of powdered magnesium. A tube of magnesium could readily be inserted in a brass tube beneath the wick, the corks being removed as it was inserted. Pressure on a rubber bulb, with tube connection, forced the magnesium powder through a slit in the center of the wick, producing a very brilliant light, which, by means of a cardboard reflector attached to the lamp, could be directed as desired.

Dr. Trueman showed an attachment for use with the Scovill Detective Camera by means of which the shutter could be readily operated, either for time or instantaneous exposures.

A device for setting the shutter of a Scovill detective camera, obviating the use of the usual string provided for the purpose, was described by Mr. Pettit.

Mr. Graff showed a portrait transparency made in 1845, by Mr. Langenheim, of Philadelphia. The precise process used was not shown, though, at that time, the paper prints known as Talbotypes were in vogue. The transparency was in a most excellent state of preservation, though, apparently, some detail in the whites was lacking. It had a peculiar, warm, purplish brown tone, which, so far as known, was the original color.

Adjourned. ROBERT S. REDFIELD,
Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—U. I. E. writes: Will you kindly inform us of any process by which a finished positive can be made in five minutes from the time of exposure, which is to be 1-50 of a second, and the positive to be taken on some flexible substance?

If there is any such process, what will the apparatus cost or how can we secure a description of the process?

A.—We do not know of any such process. It is probable that the quickest time in which a negative can be made is more than five minutes.

Q.—J. C. writes: Prints that have been placed in an album partially wet, placed under weight, and from heat and moisture have become mildewed and yellow, is there a remedy or means by which they can be restored to anything like their former brilliancy or rather color? A reply would be appreciated if you will kindly take the trouble to do so.

A.—We fear there is no good process by which such prints can be restored. The best thing to do is to make some good negatives of the pictures as they now stand and have these negatives retouched to take out the mildew marks. Afterwards bleach the prints with a solution of mercury bichloride and wash thoroughly well, then blacken them with a weak

solution of hyposulphite, and wash thoroughly again. By this means you may be able to eliminate the mildew marks, and obtain better prints to copy than those taken from the originals; at any rate the method may be useful and is worth trying.

Q.—C. St. J. McR. writes: Will you please tell me through the BULLETIN if a wooden tray lined with paraffine wax can be used for silvering bath?

A.—Yes, if the tray is dried thoroughly well in an oven before the paraffine is applied; the latter must be put on hot while the tray is hot and thick enough to completely cover the wood-work.

Q.—A. B. P. writes: What make of detective camera do you regard as the best? Do you regard Beck's lenses as the best in the market for detective cameras?

A.—We cannot undertake to recommend apparatus in these columns. Cameras and lenses depend very much upon the tastes, whims and oddities of the men that use them; but you may take it as an axiom that both cheap lenses and cheap cameras will not do the best work.

Q.—H. O. L. writes: Will you please let me know in next BULLETIN how I can keep hydroquinone from turning or discoloring, as I have lost a great deal of solution lately? I use a strong alkali.

A.—If our correspondent will send his name and address we will answer his question. We cannot break the rule given at the head of this column. Initials are not name and address.

Q.—F. F. S. writes: Please tell me through the columns of the BULLETIN where I can

procure a prepared collodion emulsion suitable for lantern slide work. Also, if it is possible to procure pigmented tissue for carbon printing in this country.

A.—Write to our publishers; we believe they can supply both of these articles. Your note about spirit photographs to hand; the process you mention is the one generally used and works well.

Views Caught with the Drop Shutter.

THE firm of W. H. Walmsley & Co. having been dissolved by mutual agreement, Mr. W. H. Walmsley, the founder and senior member thereof, has, in conjunction with others, formed a limited corporation, under the title of W. H. Walmsley, Limited. The photographic department will be under the management of Mr. J. Milnor Walmsley, who for the past five years has been at the head of that branch in the house of W. H. Walmsley & Co. The new corporation have secured commodious quarters at 1022 Walnut street, Philadelphia, where they hope to see all old and many new friends.

THE MOSS ENGRAVING COMPANY send us a handsome pamphlet containing examples of their recent achievements in the line of photo-mechanical printing. It is truly wonderful to see the progress they have made during the last few years. These examples before us are some of the most beautiful work of the kind we have seen for a long time—soft, delicate and fitted to the finest forms of illustration.

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VIEW MADE ON ORDINARY DRY PLATE.



Same View on same make of plate, Orthochromatised
with Vogel's Eoside of Silver.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor*.
ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

APRIL 13, 1889.

Vol. XX.—No. 7.

RECENT PHOTOGRAPHIC WORK AT HARVARD OBSERVATORY.

THERE is probably no more interesting example of the application of photography to scientific purposes than the beautiful researches developed at Harvard Observatory under the direction of the Brothers Pickering. Enthusiastic astronomers and expert photographers at the same time, with the resources of a great university and a number of valuable endowments to facilitate their work, they are accomplishing results that are the admiration of the civilized world.

Through the kindness of Professor E. C. Pickering we have been favored with two valuable reports of some of the more recent work done at Harvard Observatory. One of these is upon the discovery of new nebulae by photography, and the other gives the results of the photographic determination of the brightness of stars.

In the report upon new nebulae the region of the heavens selected for the research was in the neighborhood of which Orion forms the centre, and the Bache telescope, having a photographic doublet 8 inches aperture and 44 inches focus, was used for the work. The exposures varied from sixty-nine to one hundred and eighty-seven minutes, and the plates were backed with a coating of shellac and lampblack to prevent reflections from the rear surfaces of them. They were very carefully compared by Mrs. M. Fleming, one of Professor Pickering's corps of lady assistants. As a result of very careful comparisons, there have been discovered twelve new nebulae in the region around Orion, which embraced an area of about four one-thousandths of the entire sky. In the same proportion, and if the rest of the heavens yield like results, it is expected that at least four or five thousand new nebulae may be discovered by the photographic method; and it is probable that even a greater number than this will be discovered, since the neighborhood of Orion has been the favorite field of the astronomer. The southern sky has been somewhat neglected, and other regions bid fair to add much to our knowledge of faint heavenly objects, when photography assists the human eye. The telescope employed covers so large a field of celestial space that only four hundred plates are needed to embrace the whole area. An increase in the sensitiveness of plates, which is always possible, may add still more interesting results to those already obtained.

During this work around the great Nebula of Orion, photographs have been taken of it, which Professor Pickering regards as "nearly equal to the best drawings yet made, both in the extent and amount of detail shown."

Think of the labor saved by using the photographic dry plate!

The determination of the brightness of stars by photography was begun at Harvard Observatory in 1885, and the report before us is a continuation of that work. The telescope used consisted of a Voigtländer photographic doublet of 8 inches aperture, reground by Alvan Clark & Sons; the focal length being 44 inches. The dry plates used were 8 x 10 inches and covered an area about 10 x 12 degrees. The intensity of the stellar light may be measured by a photographic band, dark at one end and gradually fading to light at the other; but other methods are also used for comparison, such as the light taken from twenty stars used as standards. By methods of this character the brightness of stars within one degree of the North Pole, and which are brighter than the fifteenth magnitude inclusive, have been determined. These determinations are given in a catalogue embracing one thousand and nine "Close Polar Stars." The Pleiades was subjected to a similar investigation and four hundred and twenty stars catalogued. Finally the work was carried on in the equatorial region, and here the catalogue gives the figures of the brightness of eleven hundred and thirty-one stars.

The amount of labor in these researches is enormous, even when photography is used to assist the eye and mind of man. Without photography the work would take ages of patient labor and then not be as faithfully recorded as it is on the molecules of our good friend silver bromide in his bed of gelatine. We tender our best thanks to Professor Pickering for his kindness in giving us the pleasure of reading his handsome report. It is a monument to American photographic research.

EDITORIAL NOTES.

FROM Professor W. K. Burton, at Tokio, Japan, we have just received the first number of the *Sashin Shimpō*, or Japanese *Photographic News*, which is devoted exclusively to photography. We have tried to make out the various articles and after several efforts have concluded that one of our Japanese friends will probably make a better translation than any we could evolve. We wish it every success.

Secretary GENTILÉ, of the Photographic Society of Chicago, writes us that their exhibition will be held from May 15th to May 25th next. Those of our friends that are located near Chicago will find it profitable to visit this display of pictures and apparatus.

FROM Stockholm, Sweden, we have received the "Fotografisk Tidskrift," edited by Albin Roosval. It is published in the interest of both professional and amateur photographers, and is the organ of the Swedish Amateur Photographic Society.

THE New York Camera Club, 314 Fifth avenue, will hold meetings every Friday evening in April, when the following subjects will be submitted to the members: "Precise Photography," Lieut. C. L. Burns; "Demonstration of Collodion Emulsion Making," Mr. H. J. Newton; "Gaedicke's New System of Dark Room Illumination," Dr. Piffard; "Life Through a Detective Camera, illustrated with the Stereopticon," Mr. Alexander Black.

FROM Mr. J. A. French, of Keene, N. H., we have received a handsome little calendar, about the size of a cabinet card, which contains some gems of New Hampshire views reduced to form a very pretty border around the calendar. Judging from the reductions we cannot help thinking the originals must be excellent examples of photographic art work.

PROFESSOR S. W. Burnham sends us a handsome series of views of the country around the Observatory of the Great Lick Telescope. We hope at an early day to reproduce some of these as illustrations for the BULLETIN. In the meantime we tender the Professor our best thanks for his kindness.

THE "International Annual" is now well advanced for 1889. This year it is to be out by June 1st promptly, and Professor Elliott and Mr. W. Jerome Harrison promise us a rich store of photographic lore and a handsome series of illustrations. Papers from all parts of the civilized world are ready, and everybody seems to be willing to lend a helping hand in the good work.

WE are indebted to the Committee of Arrangements of the Joint Exhibition at Philadelphia for tickets to the Academy of Fine Arts. We hope to see this collection of pictures, and tell our readers of the impressions we obtain. There is no doubt it will surpass anything of the kind hitherto attempted.

FROM Mr. W. Reeves, of Norwich, Conn., we have received two very fine interior views taken with his magnesium flash-light. One is a $6\frac{1}{2} \times 8\frac{1}{2}$ group of children which is an excellent piece of work, and the other is an 8×10 picture of a handsome parlor. Both were taken (he says) with a No. 3 Wide-angle Aristoscope Lens, and nothing could be sharper, nor could the plates be better covered with detail than in these two pictures. The lighting also appears excellent.

[By our Special Correspondent.]

ENGLISH NOTES.

How lantern work has increased during the winter just passed! Everybody seems to have been making lantern slides and giving exhibitions. At this the plate makers have rejoiced greatly, for the manufacture of lantern plates has found occupation for their hands during what was previously the "dull season" of the year. One large firm (Fry's) gives annually a series of prizes for pictures produced on its plates; I am told that the effect has been to increase its output four-fold. Then the lantern now enters largely into politics! The Radicals are using it to illustrate a series of lectures on the Irish question, and pictures of the "evictions" are thrown nightly on the screen. It is also largely used by night as a method of advertising; a large sheet is fixed half-way up a house, or theatre, etc., and the light is thrown on it from the other side of the street; or sometimes a window frame is taken out and a wetted sheet fixed in its place, the lantern being placed in the room behind.

With the great increase in the number of users, there has naturally been an increase in the number of accidents. When an oil lantern topples over and a stream of burning paraffine meanders along the floor of a darkened room, it is

unpleasant, to say the least of it. But an explosion of the "mixed gases"—the hydrogen and oxygen used in producing the lime-light—is much worse. I have reason to believe that such accidents are more frequent than is generally supposed; but that many are "kept quiet," and never get into the papers. A few weeks ago a shock-headed boy introduced himself into my laboratory (which adjoins a public lecture hall), carrying a large half filled gas bag in his hand, and uttered the request, "Please, sir, will you fill this bag up with *gas* for Mr. Jones?" As it happened my assistants were absent and I was going out and could not comply with the request. My belief is that the shock-headed boy—full of that "zeal" which Talleyrand so earnestly deprecated—filled up the bag (which of course contained *oxygen*) out of the nearest *coal gas* burner, and took it back in triumph to his master. Anyhow, I was alarmed that evening by a fearful report from the direction of the hall, followed by loud shrieks. Running over, I found that lights had been obtained (most fortunately the large audience had not made the mad rush for the doors which so frequently takes place), and I saw that the gas-bags had been blown to tatters (the remnants of one bag hung on a gas-pipe near the roof of the hall), and that a couple of 28-pound iron weights had been thrown right over the heads of the people and had miraculously fallen in a corner without hurting anybody. And except the caretaker of the hall, who was standing in a gallery, and who received a slight contusion from a splinter of one of the pressure boards, nobody *was* hurt. After which we all (I hope) went home and said our prayers. *Moral*.—Have lock-taps on your gas bags, so that no one can interfere with them; have them boldly lettered with the names of the gases they are to contain; and *see to their filling yourself*.

The steel cylinders filled with compressed gases which are now largely coming into use I must confess I do not like. They have already claimed one victim in the person of Mr. Bewley, of Dublin; but it must be owned that his death was entirely due to his own act. His firm had taken up the manufacture of these compressed gases; and by some mistake, first oxygen and then hydrogen had been pressed *into the same wire cylinder*. Mr. Bewley appears to have been most rashly "experimenting" with the mixture, when it blew up, shattered the cylinder, and killed him instantaneously.

Probably never before have so many public exhibitions of photographs been held as during the past winter, and it is gratifying to know that all have been well attended and have paid their way. From the Liverpool exhibition there was a surplus of over \$1,000, which has been devoted by the local society to the securing and furnishing of a good set of club rooms.

It appears to me that our conventions, or conferences, or leading societies, ought to draw up sets of rules and regulations which should be binding on, or at all events might form a model for, all photographic exhibitions. The judges (if medals, prizes, etc., are awarded) ought certainly to be chosen from *outside* the locality in which the exhibition is held; and they ought *all* to be men who have themselves "won their spurs" by previous successes in similar competitions. It is said that the "art critics" are the men who have *failed* as painters. Now, we do not want similar persons—nor even "good-natured nobodies"—to judge our photographs. It is not at all a bad plan to let one prize be given by the popular vote, giving every one who enters the exhibition a voting ticket, and requiring him to write on it the number of the picture he likes best, and then to place it in a box. I remember this plan being adopted, with

great success, at one of the best photo exhibitions ever held, at Edinburgh, some twenty years ago.

Messrs. Sampson Low & Co. have just sent me for review one of the most interesting works ever published in connection with photography. It is Dr. P. H. Emerson's "Naturalistic Photography," an octavo of 307 pages, published at the very low price of five shillings. It is dedicated to the great French artist, "Adam Salomon, sculptor and photographer," for whose work in portraiture, as for that of the late Mrs. Julia Cameron (of whom I gave some account in the "International Annual") and also Rejlander's, Dr. Emerson entertains a very high opinion. Every page of this book teems with good things. Let me give a sample: "We once asked an eminent landscape painter how many negatives he would be content to produce in a year if he were a photographer. His answer was, 'Twenty first-rate things would be good,' and that meant working all the year round." We commend this saying to those possessors of roll-holders who sometimes reel off their forty-eight exposures in one day! For artistic purposes Dr. Emerson recommends, above all others, Dallmeyer's new long-focus rectilinear landscape lens, and we can join him in strongly approving of the roundness and softness of the images produced by this lens when used with full aperture.

The platinotype printing process increases daily in favor, and it seems almost useless to send in silver prints to an exhibition; the platinos always carry the day.

The exhibition, which is to open at the Crystal Palace on March 19th, bids fair to be one of the biggest things ever done in photography in this country. Every foot of space has already been taken up, and the show of apparatus especially promises to be of great variety and extent. As the Annual Conference of the Camera Club will be held in London while the exhibition is open, I shall make a study of both events for the benefit of your readers.

All workers in photography ought now to be making practical preparations for the coming season. Every article of apparatus ought to be thoroughly overhauled, dusted, repaired, oiled if necessary, and above all tested to see that it is in good working order. "Spring cleaning" is a great institution in England, and it is one which we should extend to our dark rooms, renovating them thoroughly and removing every particle of dust and dirt. The bottles of chemicals should be filled up, and a new stock of plates ordered (there are no plates like those made in cold weather). But I hear you cry, "Physician, heal thyself!" and I take your advice; I lay down my pen and take off my coat, so no more at present from

TALBOT ARCHER.

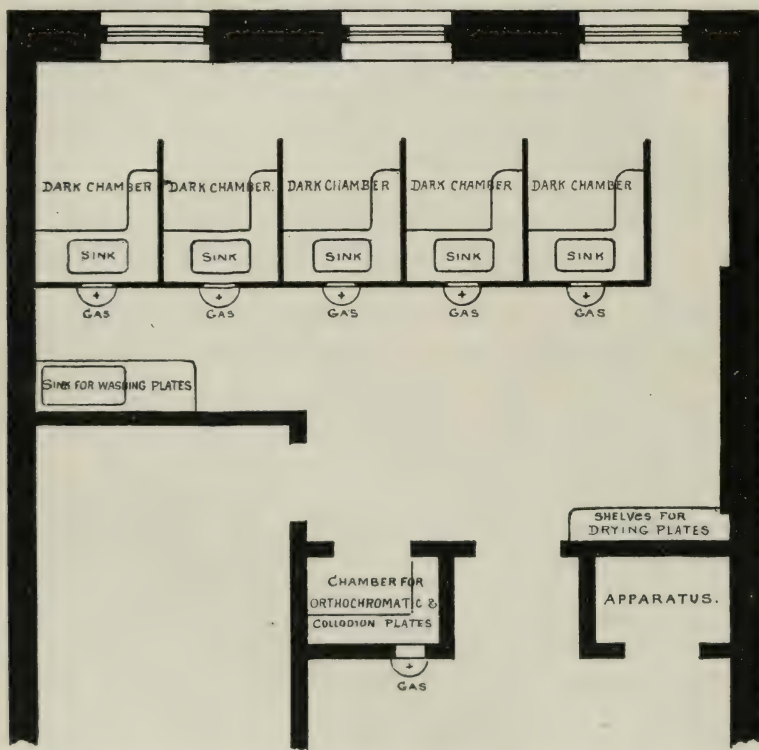
THE NEW YORK CAMERA CLUB.

THE organization of this club marks an era in amateur photography in this city. It originated in the desire on the part of some of the members of the Society of Amateur Photographers of New York to secure for this city a society or club the membership of which should consist of amateurs only.

It was further desired to provide better facilities for mutual improvement, original investigation and advanced work than were then accessible. These ideas culminated at a meeting of a few gentlemen in November last, when it was decided to attempt to carry out these purposes by the formation of the New York Camera Club. The entrance fee was placed at \$10 (since increased to \$25), and

annual dues were fixed at \$40, except for non-resident members and ladies, whose annual dues are \$20. The club became incorporated in December, and immediately took steps to secure eligible quarters for its purposes. These were found at No. 314 Fifth avenue, the two upper floors of which building were leased for a term of years.

On Wednesday evening, March 13th, the rooms were formally opened to members and their friends, and Mr. George Marshall Allen described a trip through the Yosemite, illustrated with very successful collodion slides. After the entertainment an opportunity was offered to inspect the quarters. The lower floor contains a general meeting hall in front, about 42 feet in length. In the rear and separated by portières is a smaller sitting-room and library, adjoining which is a large toilet-room with basin, mirrors, hat and coat hooks, etc.



The floor above contains in front a laboratory furnished with all necessary apparatus and utensils for preparing developers, preparing and developing platinum paper, etc., together with apparatus for making lantern slides and bromide enlargements. By the side of this room is a smaller one for printing and toning.

The middle room of this floor is the portrait gallery, with large skylight, while in the rear we find the dark room. This most important adjunct of a camera club is somewhat peculiar in construction. It is entered from the gallery by an open doorway, and the visitor is greeted by five brightly burning gas-jets, arranged in a line between the visitor and a partition, which extends nearly across the room. At the end of this partition is found the entrance to a passage which leads backwards and opens into another, which communicates with five develop-

ing cabinets, or small separate dark rooms. This description will be best understood by reference to the diagram on preceding page.

The small dark rooms are lighted by a window facing the sink, and which is illuminated through colored glass by one of the gas jets marked on the diagram. In the day-time the passages and dark rooms are lighted in the rear by three large windows, giving an abundance of non-actinic light, and at night by argand burners with ruby chimneys.

Each of the dark rooms is furnished with graduates, trays and three sets of developers, for iron, pyro and hydroquinone development.

In addition to these there is another small dark room for the preparation of ortho-chromatic plates, collodion emulsions, etc.

On the whole, the arrangements of dark rooms and laboratories and the facilities for all sorts of photographic work are the most complete and satisfactory that we have yet seen.

The Club has received from one of its members the present of a handsome enlarging and reducing camera, made by Messrs. E. & H. T. Anthony & Co., from another member a fine Scovill Gallery Camera, from another an optical lantern, and from another a copying lens.

The Club at present has between sixty and seventy members, with prospect of a rapid increase. We wish it every success.

A MONOCHROMATIC LAMP FOR DARK ROOMS.

By CAPTAIN EUGENE HIMLY, *Berlin.*

MR. J. GÄDICKE, of Berlin, has invented and brought into trade a very useful light, which manufacturers of dry plates especially can hail with joy. It is not pleasant to work all day in a dark room which is lighted by red light, and it has been even reported that in course of time people got nervous by it. Mr. Gädicke found sodium light very useful for this, but it had to be filtered through a medium which cut off the ultra violet and blue rays of the spectrum. After many trials a glass was found which is colored yellow in the mass by aid of iron, and if this light was filtered through it, it becomes non-actinic. It is recommended to use a common Bunsen gas-burner (or Auer gas-burner), over which is fitted a small ring of platinum wire. This ring receives a small wick of asbestos sheeting about one-fourth of an inch high, fitted into the platinum, moistened with a little water and then turned around in a certain powder which contains a sodium salt. Common salt would not last long, but this mixture holds out all day. I believe the powder is composed of phosphate of soda and a little borax. Spirit lamps can also be used, but do not give so much light. Over the flame can be fitted a cylinder or a kind of square shaped lantern with the above mentioned kind of glass. The light is nine times stronger than the usual red light, and is very convenient and agreeable to the eyes in preparing emulsions and dry plates.

AUXILIARY EXPOSER FOR PHOTOGRAPHIC CAMERAS.

By CAPTAIN EUGENE HIMLY, *Berlin.*

It has been known for many years that additional exposure of the plates by artificial light either before or after exposing is apt to make the plates more intense than without it. Several years ago I invented and got a patent on a new

apparatus by which diffused day-light is admitted into the camera during the exposure which shortens the same without having the bad, foggy effect of common exposures by artificial light before or afterwards.

I will briefly describe this device. The board on which the lens is fitted is pierced by slots above and below, but they do not pass the board straight, being directed obliquely down or upward. On the sides I employ round holes, so as not to weaken the lens board too much. On the front of this board a light movable frame runs in guides. The frame covers all the apertures entirely, and by means of a spring and a knob with catch, it can be raised with the hand so that all the apertures are open, while the catch holds it in position. The light can now enter the interior of the camera, but to avoid fogging, this direct light must be prevented from shining on the plate. A large piece of blackened tin, shaped like the board carrying the lens, is fitted against the board by means of four long nails or screws. This tin has in the center either a round or square aperture, so that the rays of the lens can pass through. However, the tin must slide on these nails, etc., because the more the tin is kept from the board, the more light is admitted into the camera. This diffused light mixes with those rays which come through the lens and makes the plates take the impression one-third faster. The exposure being at an end, the knob is touched, the spring draws the frame over the apertures and then light is shut out of the camera. This apparatus can be especially recommended to those who still use collodion ; for dry plates it does not answer so well, on account of the short exposure. For several years I have worked with this apparatus with great success.

As I have also to make many exposures during experiments with artificial light and the above apparatus did not answer so well, I invented therefore recently a different apparatus, which answers equally as well for artificial light as the other did for day-light. On the inside of the lens board I fasten four small electric incandescent lamps of about twenty-three volts, one after the other, and also I put in the circuit, instead of resistance, a ninety-seven-volt lamp. All the lamps receive the current from a dynamo, but batteries can be used equally as well. It has to be carefully arranged that the lamps burn only red, not white. If the lamps should glow white the plates will fog. Again, these lamps have to be screened off by a piece of blackened tin having in the center a round aperture. Through this it is impossible that any direct rays fall upon the plate, but only diffused light. Also with this apparatus the exposure is shortened by one-third without the negatives showing any unwarrantable defects ; they all have clear shadows. This kind of exposure shortener could be made use of in astronomical photography, as it is very easy to make very small electric lamps and to fit them on the photographic apparatus of the telescope. I therefore do not hesitate to publish it, hoping Harvard College Observatory and others will try it. Of course by means of a cut-off it is easy to make or interrupt the current during the exposure.

I wish to say that I find the Annual full of very valuable articles, doubly so from the fact that we get the experience and views of our English friends, as well as those of our photographers on this side of the water. The photographer who hesitates to buy a copy has but little idea of the value it would be to him. I congratulate the Editors and Publishers on the very pronounced success of the work.

GUSTINE L. HURD.

THE DETECTIVE CAMERA; A SUMMARY OF EXPERIENCES AND OPINIONS.

BY HARRY T. DUFFIELD.

[Read before the Society of Amateur Photographers of New York.]

(Continued.)

Is it not desirable that the shutter should be so constructed that the foreground receives more exposure than the sky? W. M. Butler: "A diaphragm shutter, working between the lenses, is best; this will expose both alike." A. A. Adee: "It is desirable to give more exposure to the foreground than to the sky, but shutters so constructed necessarily work comparatively slow; I have had several, and the fastest was about $\frac{1}{40}$ of a second." Archibald I. Carson: "Do not think any such arrangement possible for very quick exposures." L. M. Petiddier: "Not necessarily; an instantaneous picture generally shows uniform lighting." R. E. M. Bain: "Do not think it cuts any figure in shutter work." Rev. E. C. Bolles: "Yes: this is an imperative need, and one which the dealers should respect." M. T. Wintringham: "No; the most satisfactory work will be obtained with a shutter that distributes the light evenly." Charles Quartly: "I think not for detective work." Frederick Bruce: "Theoretically advisable, practically unnecessary." George Marshall Allen: "Yes, if you use the camera only one way; if used reversed, one side receives more light than the other; a round opening is best all around, if you cannot shift the shutter." Walter Clark: "It is an advantage in some subjects; with water in the foreground, uneven exposure would give the reflection greater value than the sky." Charles Simpson: "I should hardly think so; as, for instance, in water and street views in summer the foreground requires in bright sunlight even less exposure than the sky."

On what part of the camera should the release of the shutter be? Nineteen say on the side; nine on the bottom; two on the top. Charles Simpson: "On top or the right side; mine is underneath, and is very unhandy on that account." J. V. Black: "On the side, not on the top or bottom." H. M. Grisdale: "I like it best on the bottom, as it is less likely to be set off by accident." A. A. Adee: "Not on the camera at all; the chance of jarring in a moment of excitement is very great; it should work by the pressure of a bulb held in the hand which does not touch the camera." Harry D. Williar: "I prefer right-hand side, about two-thirds distance from the bottom, as this enables you to have use of the hand to steady and the thumb to make the release." Issac T. Norris: "Is not this purely a matter of convenience?" Major George Shorkley: "On the side, and to be worked by a movement backward, not sidewise." William E. Bond: "I prefer it on the next side to the right of finder." Edgar Richards: "Underneath, so that the victim does not know when he is shot." A. C. Abbot: "Depends on wish of operator."

Please give the formula of the developer you use? Pyro and potash, or pyro, soda and potash seem to be the favorite developers.

Walter Clark: On Seed's, Murray's developer, *i. e.*:

No. 1.

Sulphite of soda.....	1 ounce.
Water.....	8 ounces.

No. 2.

Carbonate of Soda.....	1 ounce.
Water.....	8 ounces.

Normal developer. No. 1, $1\frac{3}{4}$ ounces; No. 2, $\frac{1}{4}$ ounce; pyro, dry, 4 grains.

A. C. Abbot: Equal parts of

No. 1.

Hydroquinone or pyrogallie acid.....	10 grains.
Water.....	1 ounce.

No. 2.

Carbonate of soda.....	40 grains.
Water.....	1 ounce.

And the ferrous-oxalate developer, *i. e.*, one part of saturated solution of ferrous-sulphate and three parts of potassic-oxalate.

D. E. McComb: Modified Ripley; normal developer, as follows:

Pyrogalllic acid.....	6	grains.
Sulphite of soda.....	30	"
Carbonate of potash.....	13	"
Carbonate of soda.....	5	"
Bromide of ammonium.....	$\frac{3}{8}$	"
Citric acid.....	$\frac{3}{4}$	"
Water.....	1	ounce.

Albert H. Pitkin: Eastman's formula for ferrous-oxalate for stock solution; to each ounce of developer I try to add two ounces of brains. (Too much brains causes "fog.")

James H. Stebbins, Jr.: His own formula:

No. 1.

Pyrogalllic acid.....	50	grams.
Hydroxylamine chloride.....	6.5	"
Water.....	500	c.c.

No. 2.

Sulphite of soda (crystals).....	100	grams.
Carbonate of soda (crystals).....	200	"
Water.....	500	c.c.

Normal developer. For use take 1 dram each of Nos. 1 and 2, and add 2 ounces of water.

George Marshall Allen uses this:

No. 1.

Pyrogalllic acid.....	1	ounce.
Sulphite of soda.....	4	ounces.
Sulphuric acid.....	1	dram.
Water, to make.....	16	ounces.

No. 2.

Carbonate of soda.....	2	ounces.
Carbonate of potash.....	2	"
Water, to make.....	16	"

Edgar Richards: The Washington Camera Club developer. The club formulas have been so proportioned that a single alkali solution can be used either with the pyrogalllic acid or hydroquinone solutions. The hydroquinone developer is the one the members of the club most generally use either for time or instantaneous work. I prefer the hydroquinone because it does not stain like pyro; but I use them all indiscriminately, of course, not at the same time.

POTASH SOLUTION.

Carbonate potash, granular, c.p.....	15	per cent.
Sulphite soda (crystals) c.p.....	10	"
Distilled water.....	75	"

Commence with using one-half of the quantity of pyro solution used to begin development, and increase gradually to the full amount, 8 drams in 4 ounces of water, if necessary to obtain the desired contrast.

PYRO SOLUTION.

Pyrogalllic acid.....	5	per cent.
Sulphite soda (crystals) c.p.....	20	"
Distilled water.....	75	"

For time exposures, use 2 drams in 4 ounces of water, and increase to 8 drams gradually, if intensity of negative appears too weak.

For instantaneous and portrait work, commence with 1 dram in 4 ounces of water until development starts, then increase gradually to the full amount—8 drams.

HYDROQUINONE SOLUTION.

Hydroquinone.....	2.25	per cent.
Sulphite soda (crystals) c.p.....	10	"
Distilled water.....	87.75	"

Use 2 ounces with 2 ounces of water; add 3 to 6 drams of potash solution. Development is slow at first, but once started the negative gains density rapidly.

Continue development further than with pyro, as density is lost in the hypo. The mixed developer can be used repeatedly and does not cloud nor stain.

R. E. M. Bain gives the following :

Sal soda.....	¼ ounce.
Sulphite of soda.....	½ “
Water.....	15 ounces.

To 2 ounces of the above add 2 ounces of water and 6 grains dry pyro.

W. M. Butler uses this formula :

Granulated carbonate of soda.....	4 grains.
“ sulphite of soda.....	8 “
Pyro.....	1-3 “
Water.....	1 ounce.

A lady amateur says that this developer gives excellent results :

No. 1.

Hydroquinone.....	48 grains.
Alcohol.....	1 ounce.

No. 2.

Sulphite of soda (crystals).....	2 ounces.
Carbonate of potash, c.p.....	3 “
Water.....	12 “

Normal developer. No. 1, 1 dram; No. 2, 2 drams; water, 2 ounces. If not strong enough, the hydroquinone can be increased up to 2 drams.

Dr. H. G. Piffard gives the following developer, which, as it does not stain the hands, he names

THE LADIES' DEVELOPER.

Hydroquinone.....	1 gram.
Carbonate of soda.....	3 grams.
Carbonate of potash.....	4 “
Sulphite of soda.....	7 “
Water.....	100 c.c.

Isaac T. Norris : Pyro and soda or pyro and potash; either works well; the latter, however, needs a little care not to fog sometimes the high lights.

(To be continued.)

LANTERN SLIDE MAT CUTTERS.

BY JOSEPH P. BEACH.

[Read before the Society of Amateur Photographers of New York.]

In reducing large negatives to sizes suitable for lantern slides, the resulting positives often cannot be made conformable to the standard mats which are sold by the dealers, and hence it becomes necessary, in many cases, to make mats expressly for the required slide.

This usually has to be done by hand, with a pen-knife or perhaps a pair of scissors. Mats thus made even by expert hands are rough on the edges, or at the corners, or, where the lines should be clean cut and straight, a crooked and ragged appearance will be shown in the enlarged picture on the screen. Then, in hand-made mats, no two are exactly alike, and the making of a dozen or so involves much more labor than many persons care to undertake.

These difficulties can now be overcome by any one of average mechanical ingenuity in a very simple manner and at very small expense.

At the retail dry goods stores, “dress steels” $\frac{3}{8}$ to $\frac{1}{2}$ inch wide, made of thin steel, covered with cotton, are sold for a few cents each. At the corset factories these steels of any length and width may be procured, or sheet steel in strips may be obtained at hardware stores. The average dress steel, however, is long

enough for a lantern mat, and can be converted into a cutter by proceeding as described.

These steels are thin and pliable. They are easily cut with a pair of heavy scissors, and are readily made to conform to different shapes by screwing them to various forms of wood. The braided cotton covering is easily cut off by running a knife blade along its length. If a very sharp corner is to be turned, the steel may be softened at the required part by holding that part over a lighted gas jet for a few minutes, and then letting it slowly become cool. If required the steel may be re-tempered, after obtaining the required shape, by again heating it and while hot plunging into a bath of salt and water, or by smearing the part with grease, setting fire to the grease, and as soon as it is burned off plunging the steel into cold water. This sufficiently restores the temper of the steel to keep a good cutting edge for quite a long while.

The cutting edge is made first by filing one edge of the steel, using for this purpose a fine file, or a good cutting file, and a finishing file to give a smooth, keen edge, or the edge can be obtained by the slower process of a grindstone.

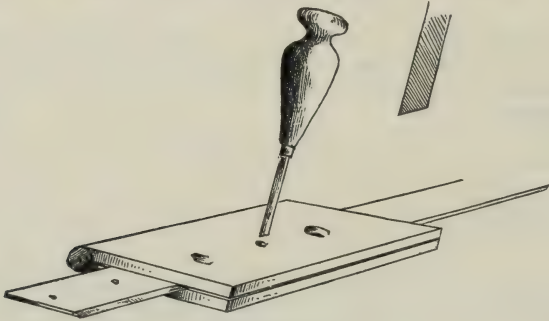


FIG. 1.—The hinge closed upon the steel strip, showing the awl just entering the die. The small section above shows the angle at which the end of the awl should be ground to work best.

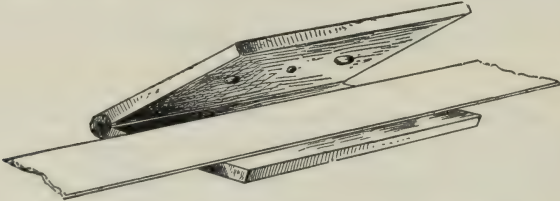


FIG. 2.—The steel strip inserted in the hinge prior to punching.

Having obtained a cutting edge (which should be made all on one edge of the steel like a chisel blade), the steel may either be drilled with holes for the insertion of small screws, or the holes can be made with a steel punch and a hammer.

Fig. 1 shows the manner of punching holes through the steel. The neatest and best way to punch a hole in the steel is to obtain an old cast-iron hinge. Through both lips of this hinge cause a hole of the required size to be drilled. Then lay the flat steel between the two lips of the hinge and close the latter upon it. This holds the steel as in a vise. Now take a shoemaker's awl the point of which has been ground or broken off flat. Put the awl through the hole in one of the lips of the hinge and strike it through the steel. This cuts a clean hole in the piece of steel, and as many such holes can be made as may be desired. It is well to grind a slight bevel on the cutting edge of the awl.

Being now prepared to make mat cutters, proceed as follows: Fashion out of some $\frac{3}{8}$ or $\frac{1}{2}$ -inch thickness of tough wood—say ash or black walnut—white wood or even pine the form of the mat you require. Make it the thickness of the steel smaller than the desired mat.

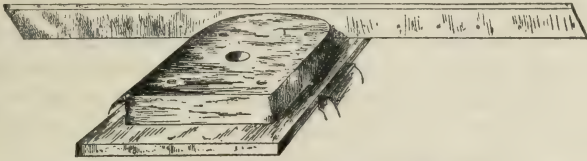


FIG. 3.—Manner of holding block in vise, and method of bending the steel around it. The lower portion is the $\frac{3}{8}$ wood to which the form is screwed.

Screw this “form” or piece of wood to another square piece, $\frac{1}{4}$ or $\frac{1}{2}$ inch larger all round than the “form.” The object of making this piece square is for convenience in using the cutter after the paper to be cut is folded. It may be folded to cut eight to twelve or sixteen mats at one cutting.

Through the center of both pieces bore a hole $\frac{1}{4}$ or $\frac{1}{2}$ inch in diameter.

Now encircle the smaller (or “form” piece of wood) with the steel, fitting the steel snug to the back or shoulder, and as it is wound around the form secure it at proper intervals, by means of screws. Small round head screws are best (say No. 2 $\frac{3}{8}$ -inch).

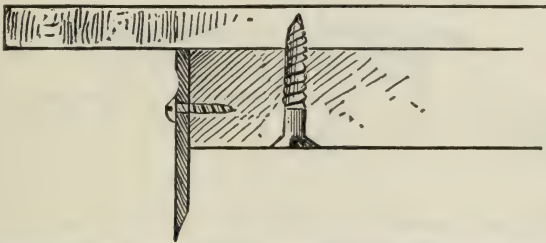


FIG. 4.—Section showing how the form block is screwed to its base, and mode of securing the steel cutter to the block.

The outside edge of the steel should be at least $\frac{1}{4}$ inch higher than the form, and the filed or bevel side of the steel should be placed next to the wooden form. Where the steel laps at the finish mark it and cut off the surplus. This

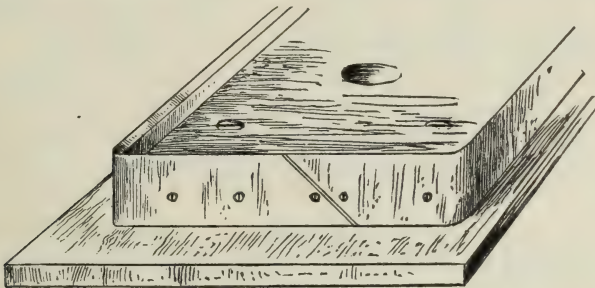


FIG. 5.—The bias joint.

joint may be further stiffened or strengthened by an extra piece of steel screwed on over the joint, but cut away so as not to interfere with the cutter.

I have found it best to cut the ends on a bias or obliquely as shown in Fig. 5, which makes a better point.

In putting the steel on the form it should be fastened first to the center of the arch on the form, then bent around each side until the ends meet as shown in Fig. 3. Owing to the elastic nature of the steel it is necessary to cut off of the sharp corners of the form double the thickness of the steel, in order that the steel will hug the form closely after being bent in place.

The cutter is now ready for use. Fold your paper to the number of mats and size required. Lay it on a block of hard end wood—that is, the end of a log of suitable size; or a block of mahogany, cherry or apple. One block a few inches square will last a long time if the precaution is taken to strengthen the sides and bottom by cheaper and heavier stuff.

There is no doubt that mats can be cut out by brass forms, made of printers' rules, which can be bought at the type founders'; but the sharp edges of these brass rules will very soon become useless and besides the cutting edge is not of the proper shape to make a clean cut mat. It pushes the paper outwardly and tears where the cut should be smooth and clean. A very considerable experience in making these cutters of various materials has convinced me that neither tin, iron, brass or German silver will do the work required as well as the thin sheet steel so readily obtained and so easily worked.

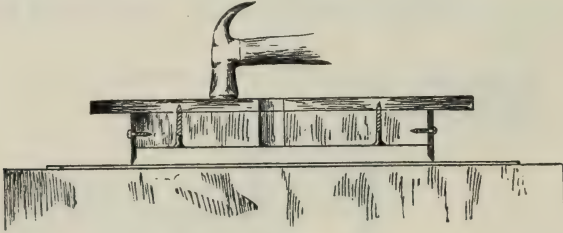


FIG. 6.—Cutting out mats.

I have made good, sound mat cutters out of $2\frac{1}{2}$ -inch gas-pipe, which was face hardened after filing the inside edge until the outer edge was a keen cutter. I have also made fair mat cutters out of square and round brass pipes as used for ornamenting chandeliers, but none of these were satisfactory or in the end worth the labor bestowed. I even had some iron and brass cast into the desired shapes, but they were not worth the labor as tools to work with. My experience teaches that the cheapest and best are those made as above described, and I have some cutters made of thin clock spring steel which have been in continuous use for several years and have not even required filing in that time.

The secret of cutting a good mat is care. After the laying on of the cutter, the blows of the hammer should first be light, and delivered all around the form. Then set the cutter in by a few more well delivered harder blows. After the cut is complete, liberate the cutter by lightly tapping it until it will come off of the cutting block.

I find it convenient, when a large number of mats are to be cut, and even if there are only two or three, to do the work in the following manner:

Take a piece of thin pasteboard the size of a lantern slide. Cut it the exact size of the folded paper you propose to cut into mats. With the cutter make this pasteboard into a mat, which should be centered if the cutter is a round or an oval. Sand-paper the inner edge of this pasteboard mat until the cutter may be easily placed within the opening.

Now, when it is desired to cut mats, the paper is folded to the size and this

pasteboard mat laid over it. The cutter is then fitted in its place and a few whacks of the hammer completes the operation without the trouble of finding the exact spot where the cutter should be placed on the blank paper.

The dress steels may also be utilized for making cutters for special purposes.

A piece of the sharpened steel an inch or two long, fastened to an appropriate handle, may be used as a chisel to cut a straight line. Another piece may be bent to an angle and used to cut out corners. A very sharp angle may be made by annealing the steel and bending it in a vise before fastening to the handle. An easier way, however, is to join two straight pieces at right angles.

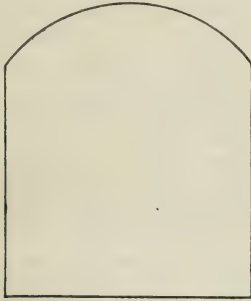


FIG. 7.

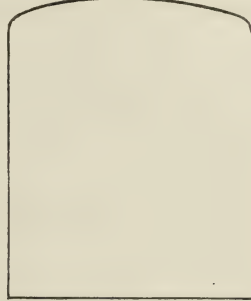


FIG. 8.

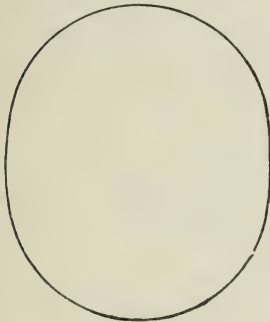


FIG. 9.



FIG. 10.

Figs. 7, 8 and 9 show some of the special shapes that can be made. Fig. 10 shows a quarter-section die constructed to make round corners.

Other shapes, like gouges or semi-circles, can be made, which will be found useful in making mats where only one or two are required.

It is obvious that this class of mat cutters can be utilized in cutting out suitable pasteboard mats for photographs as well as for lantern slides, by making the cutters of desired size.

In this way almost any person can have, at a very small cost, a mat cutter that will answer every particular purpose, and if he wishes he can have an assortment of large and small ones to suit any slide he may have prepared or any picture he may wish to mount.

It should be understood that this manner of making cutters for mats will not make such a perfect tool as the finished articles (costing four or five dollars) made by a practical mechanic, but will answer the purpose of the average amateur.

The foregoing description, with accompanying sketches, has been written at the request of one of your members who thought this paper might be useful to those who wish to make their own mats.

DEVELOPMENT IN TWO SOLUTIONS.

BY D. BACHRACH, JR.

[Read before the Society of Amateur Photographers of New York.]

SINCE writing the communication to your Society at the instance of Mr. Duffield, I have been experimenting carefully and using the method outlined in our daily practice, and in order to answer the numerous correspondents to whom it is impossible to do justice by letter (for want of time), and in order to publish the improvements and alterations I found necessary after careful trials, I will give herewith the formula I found to work the best. In my former article I put myself down in favor of the hydroquinone developer used in two solutions (as I gave it for pyro), by first dipping in one solution and then developing in the alkali alone. So far as portraiture is concerned I take that back, and I have again taken up the old friend, pyro. The hydroquinone negatives looked clearer, brighter and prettier than those developed with pyro, but, alas! like my former experience in the days of ferrous-oxalate, the promise in the negative was broken in the print. I find that the pyro negatives had a greater range of tones and retain the delicate half-tones better, while I still think that for landscape work, where more breadth and vigor are necessary, and where, on account of the volume of light, over-exposure and solarization frequently take place, the hydroquinone yields the best results, as well as in all cases where clear shadows and great density in high lights are necessary. As I find the hydroquinone keeps better if meta-bisulphite of potash is added to it, my formula now reads:

No. 1.

Hydroquinone.....	1 ounce.
Sulphite of soda.....	4 ounces.
Meta-bisulphite of potash.....	30 to 40 grains.
Distilled water.....	32 ounces.

No. 2.

Sal soda (crystals).....	2 ounces.
Sulphite of soda (crystals).....	2 "
Distilled water.....	32 "

I have also improved the formula and secured much more clearness in the shadows and improved keeping qualities of the pyro solution, by additions to the former formula, and also avoid the staining of fingers. In rapidity of development for large numbers of negatives at a time, as well as for uniformity of result, this method, in my opinion, is without a rival. The following is the formula as improved:

SOLUTION No. 1.

Pyrogallie acid.....	1 ounce.
Sulphite of soda (crystals).....	3 ounces.
Oxalic acid.....	30 grains.
Yellow prussiate of potash.....	1½ ounces.
Meta-bisulphite of potash.....	120 grains.
Water.....	20 ounces.

First dissolve the sulphite of soda in the water (heated), then add the oxalic acid, the prussiate and the meta-bisulphite of potash, and finally the pyro and filter.

SOLUTION No. 2.

Stock solution of sal soda	1 ounce.
Stock solution of sulphite of soda	1 "
Water enough to make 8 ounces of developer.	

The stock solutions of the two soda salts consist of one pound to a half gallon of water for each. The development by this process is so rapid that using partly old developer with it does not always restrain sufficiently, so in most cases an addition of a solution of bromide of potassium, before commencing to develop, to Solution No. 2, will be an advantage. For instantaneous exposures this is, of course, not required, and this method of development is especially advantageous for that sort of work.

If no old developer is at hand to mix with No. 2, it will be necessary to add some bromide solution, also the first plates will come up too rapid and flat. Old developer (No. 2) is the best to mix with the new. I use one-half as much of the old as I make of the new solution.

This developer is also extremely economical (though I do not look or care for that), not over one-third the amount of pyro being used as in present used methods.

In summer-time it may be necessary, when the solution cannot be kept cool, to add some astringent to the pyro solution to prevent softening of the gelatine and frilling. In that case I have found bichloride of mercury the best thing to use, being without any effect on the action of the developer, only hardening the film and preventing decomposition. I have used 10 grains to the 20 ounces of pyro solution given above, and a larger quantity will not hurt the solution.

MY DAGUERREOTYPE EXPERIENCE.

BY ALEXANDER BECKERS.

[Read before the Photographic Section of the American Institute.]

IN response to a request of your Chairman of the Executive Committee, Mr. J. B. Gardner, I hereby give you a brief outline of my daguerreotype experience.

The details of this senior branch of photography can interest you, I presume, only in such parts as have a bearing on the more recent modes of picture making. A comparison of these will show the progress of the half century we commemorate and also remind us of the centennial of the birth of Daguerre. The first daguerreotype I ever saw was made by Robert Cornelious, in Philadelphia. His laboratory was conspicuous, for on the outside could be seen a large mirror swung on a bracket to illuminate his sitters with reflected sun-light.

The use of bromine was not yet known in 1840; but Boudine introduced it soon after. The same year Robert Chilton called on my brother to make hyposulphite of soda, offering \$4.50 per pound; stating that the French article, though very impure, cost \$5 per pound to import. Thus the first hypo was made here, at the corner of 23d street and Fourth avenue, the present site of the Young Men's Christian Association. Orders for other daguerreotype chemicals quickly followed, and in 1843 Louis Beckers was the first to manufacture these chemicals exclusively, at Old York Road, Philadelphia.

The same year (1843) I entered the daguerreotype business of Mr. Frederick Langenheim, in the Merchants' Exchange of Philadelphia. Here there was little to be seen of the things you see now in a photo gallery. A kind of hiding-place for a dark room and a spyglass-like camera were the only indications of the mystery I was to learn. The camera rested on a candlestick-like tripod, with three set screws for adjustment, and was placed on an ordinary table. To

interchange the ground-glass and round daguerreotype plates, it was necessary to unscrew a flanged ring and replace the same by a reverse motion. For the adjustment of focus there was the rack and pinion, as Voigtlander's instruments still have. This instrument was one of the first made according to the mathematical calculations of Professor Petzval, of Vienna, having two achromatic lenses. One of these instruments was sent by young Voigtlander to his college mate, William Langenheim, as a present, with supplies and instructions, but also with the warning not to attempt daguerreotyping unless he had courage enough to try five hundred times more after failing in the first hundred pictures. This young lawyer, William Langenheim, proved not to have the courage, but his brother Frederick had, and succeeded so well that he was offered six hundred dollars for that odd camera. The preparing of daguerreotype plates will not interest you much, though I should state that the production of a chemically clean surface on silver is a difficulty that increases four-fold with the size of the plate. Another difficulty is the use of the chemicals in a volatile state. The iodine can be controlled by sight with faint day-light; but the bromine only by even temperature and constant practice. The round plates were used only for a short time, and so far as I know Langenheim was the first to introduce a square camera, plates and holders; also a tripod in place of a table. In the summer of 1843 the first dozen of small Voigtlander objectives were imported. One of these, I believe, is still in the possession of Mr. J. B. Gardner. Soon after four large ones, for 6 x 8 pictures, were imported. In the fall of that year Philippe Haas, formerly of Paris, showed Fizeau's method of fixing the image on the plate by cold gilding. Shortly after this it was found that the picture could be gilded in much less time and made more brilliant by heating the plate while the gold solution was on it, and so Fizeau's method went entirely out of use. During the winter of 1843 the first polishing wheel was made. It was constructed like an ordinary grindstone, the wheel being cushioned and then covered with buckskin. With the aid of this machine, and after weeks of hard labor, we succeeded in making the first 6 x 8 daguerreotype. At this time the only sizes used with any degree of success were 3 x 4 and $5\frac{1}{2} \times 4\frac{1}{4}$. There were also many plates used two sizes smaller that were designated as sixths and ninths. At that time we also succeeded in making a picture of a sick lady at her own residence, which was then deemed impossible.

In the spring of 1844 Mr. Edward White bought one of the large Voigtlander instruments, and for him I made the first large daguerreotype in New York City, at 175 Broadway. There were then only a few daguerreans in the city. They were J. Gurney, Anthony, Edwards & Chilton, Van Loan, Burgess, and a few others I cannot recall. I remained with Mr. White until December, 1844, when it was impossible to make a picture on account of the severe cold, for my employer would not allow a fire in his place over night. Then I commenced business for myself at the corner of Nassau and John streets, and after May, 1845, at 201 Broadway, under the firm of Langenheim & Beckers, agents for Voigtlander & Louis Beckers.

At that time the large Voigtlander objectives had a chemical and a visual focus, so that in order to make a picture sharp the lenses were moved out one-eighth of an inch. This we soon after rectified by having the ground-glass of the camera set permanently one-sixteenth of an inch nearer the lens than the sensitive plate.

That summer I took a view of High Bridge, before the scaffolding was removed. This picture was made for the engineers, and was perhaps the first taken in this country in aid of architecture.

By taking out-door views, I soon discovered that the plate increased in sensitiveness by not exposing it immediately after sensitizing. I found, however, that any very long delay (say for three hours or more) made the plate entirely useless. In 1847, the optician, Fitz, Sr., made for me a speculum metal mirror, with which I was enabled to avoid the inversion of my pictures. For many faces and objects this was a great advantage, though it doubled the time of exposure. This mirror was attached to the instrument at an angle of forty-five degrees, and

so well did it serve my purpose that I continued to use it for a number of years.

In 1848 Langenheim bought Fox Talbot's patent for the United States at six thousand dollars, but financially it proved a failure, as this process never became popular in this country. Why it should *not* prove a success is quite evident when we remember how infinitely superior the daguerreotype was to any sun picture made on paper. In England Talbot's process could be received with greater favor, as it did not come in competition with the daguerreotype as made in America. It is true that the daguerreotype was made in many of the large cities of Europe, but in none of these could it compare with the work of this country. The daguerreotypists here took the lead in the beginning; and up to the time when the collodion process became popular, never allowed themselves to be excelled by any other nation.

In 1849 my firm was changed to Beckers & Piard. Having now more time, we succeeded in constructing a machine for cleaning plates in one-third the time required by hand.

In 1852 we contrived a method for making four pictures on one plate, and in such a way that the exposed quarter was in the center of the field of the lens. To us this was a very useful improvement, for locket pictures were then in great demand. In 1856 Mr. Ormsby obtained a patent for this same multiplying plate-holder, and collected considerable money on it, until my priority claim proved his to be void. The production of stereoscopic pictures was the next task. Marshner, of Philadelphia, made patent cases to show these portraits in a very neat manner. In 1854 F. Langenheim commenced the manufacture of stereoscopic views on glass. He sent me three dozen, to find sale for them in New York. At the first exhibition of these pictures one-third of them were broken. This loss set me to thinking how to contrive an arrangement to show and secure the pictures against breakage, and in 1857 I obtained a patent for my revolving stereoscope. The increasing demand for this machine induced me to sell my daguerreotype business in 1858.

Thus being relieved from catering to the vanity of humanity, my career as a daguerrean was ended.

HOBOKEN, March 4, 1889.

FIFTY YEARS OF LIGHT, FIFTY YEARS OF PRACTICE, FIFTY YEARS OF ADVANCEMENT—WHAT ARE THE RESULTS?

BY ABRAHAM BOGARDUS.

[Read before the Photographic Section of American Institute.]

THE daguerreotype on the silver plate, followed by the ambrotype or positive on glass, and now the photograph on paper.

These various productions have followed each other in rapid succession, and the photograph, with its many variations, is the picture of to-day.

Results, did I say? The exposure in the camera reduced from thirty minutes to the fraction of a second. The at first dim, evanescent image succeeded by the strongly defined impression.

Then, from each sitting but one impression; now, from one sitting impressions without limit. Then, a burdensome and complicated set of apparatus was necessary to secure a picture; now, a spring is touched and the embryo picture is secured. Then, the nature of the materials used required the immediate and continued prosecution to the finish, no stopping or waiting in any part of the operation; now, there is no limit to the time; do it at your leisure; carry your plate thousands of miles, and develop it this year or the next. Then, the picture must be under glass for safety; now, they are mailed as freely as any printed matter. These are some of the results.

Little do the general public know of the time, labor and money spent in experimenting to bring about these results. Many expensive and difficult experiments resulted in failure. These were followed by some variations, another trial and another failure; but its votaries were not to be discouraged. Every point

was discussed, every difficulty attacked, until success was attained, and the process has been so simplified that persons of very little skill can practice it with some degree of success.

Honor, all honor, I say, to the pioneers who, by hand and brain, have accomplished all this. Many persons now enjoying the benefit of the labor of these pioneers fail to give credit "to whom credit is due," and some in their wisdom seem to consider the now easy process as the result of their superior ability; they say, "Those old fellows had a hard time to make pictures, but just see how easy we do it." The hard time those pioneers were having was the means of placing it where you can reach it, my friend.

The usual result of simplifying any difficult process is to place it in the hands of those who never would have touched it had it remained difficult, and they are the first to say, "See how easy it is!" And, as I said last month at the Society of Amateurs, "The men who have worked for half a century to bring photography to its present status know of the difficulties encountered before success was attained, and can better appreciate its worth than the novice who finds his newly purchased satchel to contain everything required, and, as the patent medicine chest says, 'with full printed directions inside.'"

Somebody acquired knowledge by careful experimenting to prepare and classify those chemicals. Somebody possessed brains enough to write those directions, and *that somebody* did not find it so easy as the aforesaid novice. Practical knowledge is acquired by hard work and does not come ready-made.

I will just mention one troublesome, and, in fact, incomprehensible, difficulty. The workers of the old wet process will remember the uncertainty in making collodion (plates did not come ready coated then); the careful and exact weighing, the mixing and the shaking, and then on trying it we found it worthless. What was to be done? Why, just buy another lot of ingredients and try it again, and perhaps with the same result; and these large bottles of worthless collodion are placed on the upper shelf, and another mixture perhaps gives you something to work with, but its results are hardly up to your desires. Now, singular to relate, after those two bottles had "sparked" on that upper shelf for two or three months, mix their contents together and they will often produce the best work you have made in years. Neither will produce a picture alone, but mix them and the combination seems perfect. When mixing our chemicals we could not tell whether they would be good or good for nothing. So much for the past.

I am now going to indulge in imagination. If my audience will go with me, I should like to carry them to a meeting that will probably be held fifty years from to-night. It will be the one hundredth anniversary of Daguerre's discovery. I do not expect to be present on that occasion, but, as I said, we will imagine ourselves there. It will be held in the year 1939. I do not know the name of the gentleman occupying the President's chair. I do not know the speaker's name; he speaks on subjects so far advanced that we do not comprehend him. The audience looks very much like the one assembled here to-night, except that the style of dress is entirely changed. The audience room is fitted up entirely different; the walls, the ceilings, the seats, all belong to an advanced age. And the light! No gas-light, no electric light or any artificial light; these are as much things of the past as the old dip candle is in our time. Although it is evening, yet the room is lighted by day-light; by a simple contrivance the sunshine is stored in a reservoir during the day, and its rays are released as needed. There are no reporters present; all out of date. An instrument with sounding-board is in front of the speaker; it is connected with wires with all the newspaper offices, and gives direct to the compositor in the printing room every word as it is uttered. This instrument is the result of a contrivance by a man named Edison some fifty years before. A venerable antiquarian reads from an old musty book found in his library the report of a meeting of a society called the Photographic Section of the American Institute, held in the City of New York, March 5, 1889. That meeting celebrated Daguerre's fiftieth year of discovery. Professor Henry J. Newton was the presiding officer and Messrs. O. G. Mason and J. B. Gardner were the members of his cabinet.

As the venerable man reads the audience laugh heartily at the antiquated ideas promulgated at that meeting, and they congratulate themselves on living in an age when such ignorance in regard to photography has passed away. The officers of that meeting are spoken of as fairly intelligent men for that dark age, but modern inventions had so completely changed everything connected with the process that the complications worried over fifty years before had become obsolete.

The reader said he found page after page occupied in the discussion of dry plates, dark rooms, flash-lights, over-timed and under-timed negatives, amateur outfits, etc. All these terms were out of use and the audience wondered what it all meant.

The reader continued, and said at all the society meetings and in all the publications of that day the one subject that seemed to occupy the entire time and attention was something called *developer*. A member moved a recess of half an hour and the appointment of a Committee to examine the society dictionary and report what *developer* was, any way. (The dictionary was a book some three feet by four and two feet thick, mounted on a frame with rollers for convenience.) The motion was adopted and recess taken. During the recess the audience interested themselves in examining some photographs made fifty years before. These pictures had been carefully preserved, and were highly valued, not for intrinsic worth, but as relics of a former age. They bore the names of Sarony, Kurtz, Falk, Fredricks, Mora, Rockwood, Anderson, Hargrave, Alman and others. These men were spoken of as "old masters." There were also exhibited some daguerreotypes bearing the stamps of Gurney, Brady, Lawrence, Becker, Bogardus and others, but there was not a person present who had ever made one or knew how they were made. It was stated that at the School of Mines of Columbia College a set of daguerreotype apparatus had been preserved, but the present faculty did not know how to use them.

On re-assembling the Committee asked for time, saying it would be impossible to report before the next meeting, as the subject of *developer* occupied a large portion of the big book, and the more they read the less they knew; and they should be obliged to call to their aid all the professors of some college to explain the complication called *developer*. The remaining time of the meeting was used to show the great advances made since the semi-centennial referred to, and for the men of that day to think they knew anything about photography was simply ridiculous. "Why," said one worthy brother, "they could not produce a color, and they could not deliver a dozen pictures under several days, as they even printed with nitrate of silver in the sunshine only, and they did not know any better than to fix their prints with hyposulphite of soda, that miserable salt, that eats itself up and bleaches everything it touches."

The newspapers of that day, claiming a circulation of as many millions as they now do of thousands, are all printed from negatives. The matter once set up is immediately photographed on plates the size of the sheet, and as many negatives as are required to print the immense edition are at once supplied.

There are no photograph galleries at that day. An individual carrying a camera under his arm goes from house to house and takes your picture. The lenses are at one end of the box and the finished picture comes out of the other end, *if the box is long enough*. It's the make-'em-while-you-wait process.

All the photographic literature was practical. The writers on imaginary theories and impracticable nothings had long since gone to their own place. No demand then for articles on the "Evanescence of nothing as compared with the translucent equanimity of the intangible."

When the meeting adjourned the audience were conveyed to their homes by real rapid transit, propelled by electricity, which had superseded steam; and by its use time and space were almost annihilated.

There, I think we have been away long enough, and had better come home while it is safe.

I am asked all kinds of questions. Will the colors ever be photographed?

Well, in this day of wonders I am not going to say. Scientific men say color is a sensation, and when we can photograph a sensation then we shall have the colors. A good story is told of a woman who brought her bouncing baby for a picture. When the operator came with his plate he found her "spanking" the baby. When asked why she did that she said he always had such a good color after that operation. Still, I do not think the color in this instance was a chemical production. It seems to have been produced by *hand*.

Question.—Is photography a fine art? That depends on where you get your pictures. If you go down to Coney Island the proprietor is so *clam-erous* for patronage that he does not give much attention to the "art" question; but many of the pictures produced in Europe, and also in this country, show as much art in posing, lighting and composition as many of the world-renowned works of art do.

Question.—Will photographs fade? I hope so. I hope the cheap trash now made in quantities will fade, and that right early, and not disgrace this age in the eyes of the next generation.

Question.—Will prices continue to come down? With the photographer on one side, and the employee, stock dealer and the landlord on the other, I hope not. From certain notices at the photographer's desk, I think it's the sitter who is obliged to "come down."

Question.—Is it true that the photograph of the murderer has been seen on the eyes of the murdered man? Well, we are using many substances nowadays for photographing, but I have not seen any exhibited on dead men's eyes. When I see that I shall look for my picture on the eyes of every fish I catch.

Question.—Will the process be still shortened? They are taken pretty quick—so quick that some of the pictures of females seem to have been taken before they had had time to more than half dress themselves.

Question.—How many New York photographers have retired rich?

Question.—Where do photographers go to when they die? These questions I will answer when I get the statistics.

THE DAGUERRETYPE PROCESS.

BY J. B. GARDNER.

[Address before Photographic Section of American Institute.]

Mr. President, Ladies and Gentlemen.—It is now a half century since the daguerreotype process was first whispered to a distinguished American citizen, Samuel F. B. Morse. He says: "In the winter of 1838-39 I was in Paris, and was invited by Daguerre to see his results in sun painting. At this time, viz., early in the spring of 1839, he was awaiting the action of the government respecting the pension to be granted him in case he would publish his process.

"I immediately wrote to my brothers, the editors of the New York *Observer*, giving an account of this visit, and this letter was published by them some time, I think, in April, 1839. So far as I know this was the first public statement of the discovery in America. In July and August of the same year Daguerre received his pension and the process was published. After my return to New York I received a copy during the latter part of August, and immediately I had made for me the apparatus as described in the book. When this apparatus was completed I commenced experimenting, and soon verified the truth of Daguerre's revelations.

"The first experiment crowned with any success was a view of a Unitarian church on Broadway, taken from the third-story window of the New York City University. It was in September, 1839. I then immediately experimented with a view to make portraits, and my first attempts were on the roof of a building in the full sun-light. My subjects were my daughter and some of her young friends. Of these I still have portraits, made in October, 1839. At this time Professor John Draper was making experiments in the same direction, and also others who had received a copy of Daguerre's first book. I cannot say, there-

fore, who made the first daguerreotype portrait in America, though I believe this country has the honor of making the first."

Mr. John Johnson (of the firm of Walcot & Johnson) exhibited before the Mechanics' Club, April 14, 1858, a daguerreotype portrait which he states was made on the 7th of October, 1839.

Messrs. Morse, Draper, Johnson and Prosch all lay claim to making the first daguerreotype portrait, and the testimony of either of these gentlemen, without a knowledge of the affirmations of the others, might appear quite sufficient to award either of them the honor they claim.

Quickly following these were Drs. Bierd, Godard, Wildman and Parker; Messrs. Reed, Cornelius, Mason and Professor Johnson. All these were citizens of Philadelphia, and the last named (Professor Johnson) was the first, no doubt, who took a daguerreotype portrait in that city. It was a likeness of Dr. Kenedy, the Principal of the Polytechnic Institute, and taken some time during the year of 1839.

In 1845-46 Frederic Langenheim was generally acknowledged to be the most successful practitioner of the art, and following him were Messrs. Van Loan, Mayall, Plumb, Simons and Root. Of all the cities in the Union, Philadelphia appears to have been the most noted for its distinguished daguerreotypists. It is worthy of note, that the name of no distinguished artist appears among these experimentalists. In fact, the practitioners of high art entirely ignored photography, and yet it has proved to be a greater help to their profession than to any other. The apparent simplicity of making sun pictures led a great variety of talent to engage in the business. Many believed it was a field in which there was but little labor, and much profit; that it required neither capital nor brains, and was just the kind of work for those who had failed in every other enterprise. Hence mechanics and traders of all kinds, as well as those of the learned professions, were soon found exploring its mysteries. It was commonly believed that this art was within the reach of almost any class of workers, and thus it was more rapidly developed than it might otherwise have been; for the mechanic soon learned how he could make many improvements in its mechanical devices; the chemist, how he could add new compounds with great advantage; the trader how he could attract public attention, and the optician how he could construct lenses that would make his name famous for all time to come. Thus this great variety of talent soon became classified, and so specialists were developed in every branch of photography. Hence we have now in every well organized gallery a positionist, a chemist and a mechanic, all experts in their several branches. This division of labor is no doubt a great advantage to the patrons of the art, as they thus get better work for less money; and it is also an advantage to those who invest their capital in the business, as it is only the combination of money and skill that can insure success. The day is past when the jack-of-all-trades can make photography a means of support. And so fifty years of unceasing progress has convinced the most skeptical that photography has come to stay, and will continue to win the approbation and support of the public.

In 1840 the daguerreotype art was first practiced in New York City as a business. During this year Mr. J. Gurney was the most conspicuous. He was soon followed by Messrs. Van Loan, Lawrence, Burgess, Brady, White, Beckers, Anthony, Edwards & Co., Plumb, Lewis & Holt, Haas, Insley, Thompson, Gardner, Bogardus, Meade Brothers, Fredricks, Anson, and Harrison & Holmes. There may have been others whose names have escaped my memory, but a large majority of those mentioned no daguerreotypist will be likely to forget who came in competition with them, for they were the giants of their age and generation, each contributing something to the development of the art that can never be forgotten; for these contributions combined formed the foundation of all subsequent progress and success. These men, or a portion of them, after some ten or fifteen years' practice in this first dry-plate method, turned their attention to the collodion process, and a few of these pioneers have followed up the art through all its changes to the present hour; and some of these are with us to-

night, and will, no doubt, add their mite toward the entertainment of the hour. We have with us to-night of these, Messrs. Gurney, Beckers, Bogardus and Gardner, all of whom have promised to contribute their mite toward the entertainment of the hour. Hence, where a number are expected to take part in the programme of the evening, it would be *inapropos* for me to consume the time with any elaborate paper. I will, therefore, simply relate an incident or two, and then give place to others more competent both to instruct and to entertain.

During the early days of my daguerreotype practice I had a business circular printed, and among other things were the words: "Instruction given in the Art." What presumption! What did I know of the art? What did any of us who were then engaged in the business know about it? Even the best of us scored more failures than successes. And with *us* every picture was counted a success that was accepted by our patrons; and that this success might be made doubly sure, we were always careful to have our pay in advance. This of course we regarded as a simple preservative of our good nature, and a means of maintaining our equilibrium in case our customer failed to perceive and duly appreciate our labors.

A few days after issuing the circular referred to, I called on one of my neighbor daguerreotypists on Broadway. He at once began to chide me, not for my presumption in assuming the rôle of teacher, but for thus trying to increase competition in the art. He affirmed that the practice of the art was a secret, and for our own protection should be kept to ourselves; and then boastingly asserted that there were already too many in the business, and that his establishment, without the aid of another in the city, could make all the daguerreotypes New York demanded. My reply was, that what he said might be true, and yet I must differ with him in regard to keeping the art a secret. In my judgment it was good policy to induce as many as possible to invest their time and money, and so make them co-laborers with us in attracting public attention and thus aid in creating a greater demand for our services. Or, in other words, the more money and brains we could bring to bear upon the art, the more assured would be our success. But with all the arguments I could bring to bear on this question, I am quite sure I failed to convince him, for to-day he is as secretive as ever and continues the old cry: "Too many in the business."

In this endeavor to justify myself in advertising for pupils, I became thoroughly convinced of the truth of my position, and I have seen no good reason to abandon it up to the present hour.

I therefore hail with pleasure the rapid growth of amateur photography throughout the world, and expect from it, as in time past, the most useful and entertaining literature, the most valuable scientific discoveries, the most skillful applications of high art, and the highest social conditions due to the profession.

PHILADELPHIA EXHIBITION.

DURING this exhibition, which takes place April 8th to 20th inclusive, there will be special lantern exhibitions every Tuesday and Thursday evenings at eight o'clock, in the Lecture Room of the Academy of Fine Arts. Admission to these lantern exhibitions will be by special ticket.

The Board of Judges of the Exhibition consists of Messrs. John C. Browne, George W. Hewitt, James B. Sword, Xanthus Smith and Frederick B. Shell.

The foreign exhibitors have sent thus far over 180 prints, and American photographers have entered over 440 frames—many of the frames containing quite a number of pictures.

Professor S. W. Burnham, of the Lick Observatory, has sent some fine photographs of the moon—the largest ever taken, about which our readers already know through the excellent prints published in the BULLETIN. He also sends

some fine interior and exterior views of the observatory, and surrounding mountain scenery.

Among the foreign exhibitors from whom pictures have been received are the following:

Frank M. Sutcliffe, of Whitby, Yorkshire, England; and John Patterson Gibson, of Hexham, England, both of whom were awarded prizes at the Joint Exhibition at Boston, in 1888. Mr. Sutcliffe received two awards for best landscapes and animals.

Arthur R. Dresser, of Kent, England; G. West & Son, Southsea, England; W. W. Winter, Derby, England; W. C. Harvey, Gosport, England; Alfred Stieglitz, Berlin, Germany; Harry Symonds, Portsmouth, England; Mr. and Mrs. W. J. Anckorn, Arbroath, Scotland; James Brown, Newcastle-on-Tyne, England; Richard Keene, Derby, England; Paul Lange, Liverpool, England; Charles Edw. Wyrall, Aldershot, England; W. H. Geddes & Son, Arbroath, Scotland; Harry Tolley, Nottingham, England; Dr. P. H. Emerson, Suffolk, England; Konstantz Krzyzanowski, Turbow, Russia.

PHOTOGRAPHING THE NAVAL PARADE.

WE learn that Mr. F. C. Beach has secured for the Society of Amateur Photographers and friends the commodious steamer Philadelphia, which under his direction will occupy the best positions for photographing the interesting Naval Parade which is to take place on the 29th of this month. The number is limited to 200, and tickets will be sold only to members at \$1.50 each. The steamer will probably leave the pier foot of East 31st street at 9.30, and at Pier No. 27, East River, near Peck Slip, at 10 A.M. There will be no postponement on account of the weather.

OUR ILLUSTRATION.

THE utility of orthochromatic photography is becoming more and more apparent day by day as new workers enter this field of photographic research and develop some new phases of the art. There is probably no photographic investigator that has so persistently labored to obtain good results in this line as our esteemed correspondent, Dr. H. W. Vogel, and the results he has achieved speak more than any words of ours for the success of his labors. In the present illustration to the BULLETIN we give an example of some of his latest work. It is very evident on looking at the prints that the eoside of silver plate gives some very remarkable and extremely desirable results. The wonderful detail of both foreground and distance in the lower print is a result hitherto unattainable except with orthochromatic plates. Those of our readers who are interested in landscape work will be charmed with the results obtained with eoside of silver.

I WOULD not be without the BULLETIN for a good deal. The "What Our Friends Would Like to Know" department is worth the full subscription.

S. T. BARTLETT.

THE BULLETIN is an ever-welcome assistant to me, every number seeming to be better than the last, if that be possible; and the more I see of the publication the better I like it.

J. L. TAIT.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE — PHOTOGRAPHIC SECTION.

INFORMAL MEETING, MARCH 20, 1889.

Vice-President J. B. GARDNER in the chair.

Mr. O. G. MASON exhibited and explained a very clever device for shading the lens when taking flash-light pictures.

This was followed by a talk concerning photographic literature. (As the reporter was requested not to mention the names of some of the speakers, they are here purposely omitted.)

The first speaker said "that the books, in his experience, had often led him into trouble, and he had frequently found them a snare and a delusion."

The second speaker said, "He seldom read a photographic book, and that he mostly depended upon his own experiments to win success. He had but little faith in the statements of his competitors when they told him how he could make just as good work as they did; that when he obtained anything valuable it did not often come by their suggestions, but by his own individual labor and perseverance. He had often noticed, too, that such of these

as were in the advanced guard, and had won the highest reputation, usually exercised the greatest amount of caution and secretiveness, and were not apt to publish the methods of working by which they had achieved their greatest success. And this was true of amateurs as well as professionals; for often the lover of fame was no less secretive than the lover of money. If this class published anything, it was usually formulas they had long since abandoned for something better. Hence publishers found it difficult to record the latest and most approved methods of working; especially if they expected to fill their pages with voluntary contributions. A better photographic literature, or one more reliable under existing circumstances, could hardly be expected.

The Chairman said: "It was no doubt true that books sometimes prove a snare and a delusion, not because they are erroneous in their statements, but because they often leave some portion of the process to be discovered by the presupposed knowledge and judgment of the reader. The same thing often happens in oral statements. For example, an expert operator tells me he makes his silver bath by dissolving in ordinary croton water forty grains of silver in each ounce required that has been previously acidified. Such a statement is so different from my method of procedure that I am at once inclined to believe that he is purposely leading me astray. And the chances are that I do not follow his advice, or, if I do, I am more than ever convinced of his deception, because I have tried and failed. Yet what he said was true, and it was my fault in not being successful. I failed simply because I used only the small amount of acid required in purified water, or water in which the organic matter has been precipitated. If I had used sufficient acid to hold the organic matter in suspension, I should have been successful; and instead of condemning my friend I should have thanked him.

"As regards amateurs being as secretive as professionals, much depends upon the intent as to how they shall win the greatest fame. If their object is simply to make better pictures than any of their compeers, they may be secretive concerning their methods of working; but if they wish to obtain fame by their superior knowledge of the art, their chief motive of study will be that they may publish the results of their labors. There are numerous examples of both these classes, and both reap their legitimate reward.

"In spite of all exceptions that may be taken

to the usefulness of photographic journals, it cannot be denied that they perform a good service by means of their advertising columns; for they aid greatly practical photographers in procuring the most approved apparatus, and the means of working the most successfully. If it were not for these advertisements the probability is we should have no photographic journals, and until photographers demand something better in way of literary matter, and are willing to pay for it, any changes for the better can hardly be expected.

"Now, although there may be many things stated in these journals that have been written from theoretical standpoints, or by those who have obtained their information from unreliable sources, yet this is no valid reason for never looking into these books; for if nothing else is gained, the reader will thus increase his vocabulary of language and so improve his own writing or speech in matters especially pertaining to his profession.

"Few photographic books from the beginning of the art have escaped my notice, and I think I can truthfully say, 'There are none so good some blemish doth not blot; there are none so bad some good redeemeth not.'

"For a number of years it was my habit to keep these books, and am only sorry that I did not continue this practice to the present time.

"We have, however, one member of the section, Mr. O. G. Mason, who I believe has kept up this practice, and hence, no doubt, has a larger collection of photographic books and journals than can be found in any of our public libraries. It is to be hoped that after his death and when his will is read, that it will be found that the Photographic Section of the American Institute is the rightful heir to this portion of his estate."

The Chairman announced that at the next regular meeting, April 2d, there would be a lantern exhibition of "The Open Air Statuary of New York City," by Mr. Charles Simpson.

The section then adjourned.

CLINTON HALL, 19 ASTOR PLACE.

Regular meeting, April 2, 1889, *President* H. J. NEWTON in the chair.

The *Secretary* reported the receipt of the usual journals and papers contributed to the Section.

The Chairman of the Executive Committee reported that the subject of the evening was "The Open Air Statuary of New York City," by Mr. Charles Simpson, illustrated with the stereopticon by A. D. Fisk, Esq. He also

stated that an opportunity would be given to any persons present to make such comments, after Mr. Simpson's description of the statues, as in their judgment might be apropos to the occasion.

He also announced that an informal meeting would be held in the Trustees' room of the Institute, Wednesday evening, April 17th, to which all interested in technical photography were cordially invited.

President NEWTON then introduced Mr. Charles Simpson, who, after a few preliminary remarks, proceeded to describe the statuary as presented to the audience, confining himself mostly to the date when the statue was unveiled, where it was located, by whom it was erected, and the artist who designed it, together with a brief outline of his life and public work, the substance of which has already been published in the report of the January meeting of the New York Society of Amateurs, in the record of their proceedings.

Mr. Simpson, by his animated and pleasing descriptions, kept his auditors in the best of humor, and easily held their attention, from the beginning to the close, by the excellence of his work.

Mr. O. G. Mason followed with some very apropos remarks respecting the obligations of the Section to Mr. Simpson for his labor of love, and offered a resolution that the large audience present tender him their sincere thanks. This resolution was unanimously and loudly responded to in the affirmative.

The Chairman then introduced the sculptor, Mr. Wilson Macdonald, who occupied the remaining portion of the evening in relating a number of amusing reminiscences, and in enumerating some of the reasons why we did not have better open air statuary, and why we were so far behind the old world in this regard. He also endeavored to show how we might overcome these defects, and in course of time develop an artistic force that would eclipse the most brilliant and praiseworthy work of the past.

A vote of thanks was tendered to Mr. Macdonald for his very entertaining and instructive discourse, and on motion the Section then adjourned.

CASE SCHOOL CAMERA CLUB (CLEVELAND).

At the regular meeting, Friday afternoon, March 22d, the demonstration of the development of a negative with hydroquinone was very well illustrated by Mr. Lafayette D. Vorce photographing the members before the

meeting and developing the plate during the meeting. Although the day was dark and the time was late the negative obtained was first-class.

The Rev. Dr. Tenney exhibited to the members some handsome 5 x 8 views of Cleveland and vicinity.

At the next meeting (April 5th) a demonstration of amateur dry plate making will be given by MILTON B. PUNNETT.

WILLIAM T. RYNARD was elected an Active Member of the Case School Camera Club at the regular meeting, Friday afternoon, April 5th. The subject to be demonstrated was "The Making of Dry Plates," by Corresponding Secretary Punnett. It included, besides the modes generally followed by the amateur, an explanation of the process as conducted by the manufacturers. The solarization of plates, caused by an extremely long exposure, was also discussed. The subject for next meeting will probably be a demonstration of the aristotype paper by one of the members.

MILTON B. PUNNETT,
Corresponding Secretary.

ST. LOUIS CAMERA CLUB.

ST. LOUIS, MARCH 5, 1889.

THE meeting of the St. Louis Camera Club was called to order at 8.30 P.M., by *President* BAIN, with thirteen members present.

The minutes of the last meeting, February 19th, were read and approved as read.

Messrs. Joseph Berend and George W. Boswell having received the total vote of the members were declared duly elected.

Secretary BUTLER—I received a letter saying that the set of slides known as "The Boston Illustrated Slides" would be sent here after going to San Francisco.

A telegram, dated Greensburg, Ind., was received from Mr. Charles W. Melcher, saying that he could not be in St. Louis in time for the meeting, and asking that the reading of his paper be postponed two weeks.

President BAIN—I suggest that Mr. C. H. Holland and Mr. H. B. Alexander prepare papers to be read at the next meeting.

Secretary BUTLER—I thought it might interest the members to know how the Club stands financially, so I have figured it out and I find that the balance in the treasury is \$197.70.

A short discussion took place as to the relative merits of the different kinds of powders for making flash-light photographs, and it was

found that most of the members who had tried the different kinds preferred pure metallic magnesium powder, and those who had tried the different ways of lighting the powder preferred blowing it through a flame to lighting it on paper or gun-cotton, as there was less waste of the powder.

Mr. Bain exhibited a magnesium flash-lamp to be used over a gas-burner, which was very simple in make but worked very well.

Dr. Keith also exhibited an alcohol flash-lamp, which was very good.

Mr. BLATTNER—Those members who are interested in the toning of blue prints will find this a very good formula:

Take 70 grams of borax, 1,100 cubic centimeters of water, drop sulphuric acid into this until blue litmus paper turns red, and then add ammonia until red litmus paper turns blue. Add 10 grams of catechu and stir until dissolved. The prints are immersed in this solution and left in it until toned as desired. The more ammonia there is in the solution, the darker the high lights become.

The meeting adjourned at 9.15 P.M., after which the slides of the Pittsburgh Amateur Photographic Society were exhibited, some of which were very good. After the exhibition of slides had taken place, two flash-light exposures were made; one with Mr. Bain's lamp, which made a very good negative, and one with Dr. Keith's, which made a fair negative.

MARCH 19, 1889.

THE meeting was called to order by *President* BAIN at 8.35 P.M., with seventeen members present.

Applications for active membership from Messrs. Henry Hitchcock, Jr., and Frank J. Hickman, were read and referred.

Secretary BUTLER called attention to the fact that at the next meeting the annual election of officers for the ensuing year will be held and reports of the various committees read.

The *President* called upon Mr. Melcher to read the paper he had prepared on sepia platinotype printing.

Mr. MELCHER—I have here a tin box for preserving platinotype paper, which it is necessary to have dry in order to make prints. The platinotype paper is much more sensitive than silver paper. In preparing the developer take 4½ ounces oxalate potassium to 16 ounces water for black prints. When making sepia prints add 1½ drachms of the sepia solution to 1 ounce of the oxalate solution. When the paper comes by mail it is put up very carefully and wrapped in oil paper to keep out the

moisture. It comes in sheets about 18x22 and costs thirty-five cents per sheet. One sheet will cut up into 12 pieces for a 5x7 negative, and it is prepared clear out to the edges, so that there is no waste. After developing the prints, filter the oxalate solution, and it can be used over again by adding an equal quantity of fresh oxalate solution to it. The paper should be rolled with the prepared side out. If you roll it the other way it will make air bubbles on the print in floating. The paper in mailing is generally rolled the reverse way, and it is natural that it should be rolled the other way to be used nicely. The sepia paper is much more sensitive than the black.

After the prints are developed in this solution they are placed prepared side downward in a solution of muriatic acid about one part in sixty. Repeat this two or three times in fresh solution of acid and leave the prints about ten minutes in each bath. After thoroughly washing in three or four changes of water they have only to be dried to be finished. The prints can be corrected to a certain extent. If they are under exposed, have the developer very hot, and if they are over-exposed have the developer cooler.

Mr. Melcher developed a number of prints while explaining the process.

A letter from Mr. Achterman, dated Cincinnati, was read by Fr. Charopin, saying that he had found a new printing paper which worked something like platinotype paper, but all that was necessary was to make the print and wash it in water to develop it.

Secretary BUTLER—Mr. Sherrard has authorized me to say that if any of the members desire the platinotype paper from Willis & Clements, he will obtain it for them and also the sepia toning solution.

Considerable discussion took place as to whether the Club would continue holding two meetings or have but one meeting per month, and it was finally decided upon motion of Dr. Keith to continue the two meetings per month, and that the first meeting of the month be devoted to business and the second be a social meeting for the discussion of photographic subjects.

Upon motion of Mr. Charles Holland, the Secretary was authorized to insert a notice of the Club meetings in two of the daily papers in addition to the regular notices sent by mail to the members of the Club.

MR. ALEXANDER (Chairman of the Lantern Slide Committee)—The Philadelphia Amateur Photographic Society withdraws from the Association this year, and the New Brunswick,

N. J., Club is admitted to the Association. At the annual election of managers the result was the election of Messrs. Bullock, Beach and Rau as manager and assistants. I also had a communication from Mr. Beach, in which he states that the English lantern slides will reach here in the latter part of April.

Upon motion of Mr. Blattner it was decided to exhibit the lantern slides at the meeting held on the third Tuesday of each month and that the papers be read at the first meeting of each month.

Upon motion of Mr. H. B. Alexander the President of the Club was authorized to appoint an Assistant Secretary to assist the Secretary under his direction in any way that the Secretary required in getting out notices and such work as the Secretary was in the habit of getting out himself.

The meeting adjourned at 9.50 P.M.

WILLIAM BUTLER, *Secretary*.

NEW ORLEANS CAMERA CLUB.

THE regular monthly meeting of the Camera Club was held February 20th, at Tulane Hall, *President* H. T. HOWARD in the chair, Mr. CHARLES H. FENNER, *Secretary*, and twelve members present.

A communication from Mr. F. C. Black, acting manager of the American Lantern Slide Interchange, was read requesting the New Orleans Camera Club to select one of its members as a delegate, who shall constitute one of a Board of Directors, which, on the 1st of March, organizes and elects, from among themselves, an Executive Committee of three.

President H. T. Howard was elected delegate.

A vote of thanks was unanimously tendered Messrs. E. & H. T. Anthony, of New York, for a very handsome volume of Anthony's BULLETIN.

Mr. P. E. Carriere was elected Librarian for the Club, and Messrs. H. Carpenter and P. E. Carriere appointed a Committee to purchase a book-case.

Mr. Horace Carpenter was tendered a vote of thanks for the insurance of the lantern free of cost.

The report of the Treasurer for the Given benefit was read and approved, and showed gross receipts, sale of tickets, \$329.25; expenses, \$54.25, leaving a net balance of \$275. The amount is to be presented the widow of the hero, James Given, by the President, as the contribution of the New Orleans Camera Club.

A vote of thanks was unanimously tendered the *Picayune, Times-Democrat*, Garcia & Fauche, Kuntz Son, the Orpheon Francais, and the ladies and gentlemen who contributed to the success of the entertainment.

Messrs. P. M. Westfeldt, C. F. Low and R. H. Palfrey were elected active members, and Mr. C. P. Richardson a corresponding member.

Mr. J. A. Hinks moved that a lantern slide exhibition be given Saturday, the 23d, at the Cotton Palace, for the benefit of the Ladies' Unsectarian Aid Society.

The motion was carried, and Mr. Horace Carpenter, whose fund of humor is inexhaustible, has been chosen to describe the slides as thrown on the screen.

Mr. Carriere gives notice that at the next monthly meeting the by-laws be so altered as to admit ladies to membership free of initiation fees and dues.

On Friday, the 22d inst., the Club will give a complimentary lantern slide exhibit, the slides to consist of views contributed to the American Lantern Slide Interchange by the Photographic Society of Philadelphia.

The meeting then adjourned.

CHARLES H. FENNER, *Secretary*.

LOWELL CAMERA CLUB.

A REGULAR meeting of the Lowell Camera Club was held at Morrill's Studio, Central Block, March 19th. It was decided to hold the club meeting at this place during the season, and to keep the library in its present quarters. The Committee reported in favor of joining the New England Lantern Slide Exchange, as proposed by the Providence Club.

It was voted to postpone action upon the proposed exhibition of photographic work by this Club until the April meeting.

Mr. W. P. Atwood read the paper on the subject for the evening, "The Development of the Dry Plate." He presented the subject in such a way as to make the process clear to beginners, and gave many suggestions of practical value to the experienced photographer.

The membership of the Club now numbers forty-three. Several were admitted to membership at this meeting.

GEORGE A. NELSON, *Secretary*.

LYNN CAMERA CLUB.

At a meeting of the Club, held Tuesday evening, March 26th, President W. H. DREW gave a demonstration of the process of toning

"Aristo" paper, which, although not a new printing paper, has recently been prominently brought to attention as possessing some advantages over the ordinary silver paper which is sensitized by floating. In printing ordinary silver paper it is necessary to carry the tones somewhat beyond those desired in the finished print, as the toning process is a bleaching process with this paper, but the opposite holds true with aristo paper, the hyposulphite bath intensifying the tones beyond those observed when the print leaves the gold solution, and care must be exercised not to carry the printing too far.

After printing the paper is first washed in a small quantity of cold water to wet it thoroughly, and as the paper has a decided tendency to curl, it is best to carry through but a few prints, say three or four, at a time. It is then washed in at least three changes of lukewarm water, which may have a temperature of about 100 degrees F., or until all milkiness of the water has entirely disappeared. Aristo paper is sensitized by a collodion emulsion, and this preliminary washing is to remove the free silver before toning. The formula for the toning solution is as follows:

Sulpho-cyanide-ammonium solution ($\frac{1}{2}$ oz. to 24 ozs. water).....	1 part.
Chloride gold solution (15 grs. to 24 ozs. water)	2 parts.
Water.....	3 "

The toning bath, unlike that for silver paper, should be slightly acid, and can be made so by the addition of a drop or two of sulphuric acid. If alkaline it will not tone. The toning has usually proceeded far enough when the high lights of the print show a bluish appearance, notwithstanding that the dark portion may have a decidedly reddish tint. Should the toning be carried too far the finished print will have a slaty color. The fixing bath is made as follows:

Hyposulphite soda.....	1 part.
Water.....	20 parts.

The bath should not be made much stronger than this or it will be apt to affect the film and injure it. Fix until the desired tone is attained and the reddish tint disappears from the high lights. From the fixing bath the print should be placed in washing water, and remain an hour or so. The advantages claimed for the aristo paper are that it gives more detail in the print than the floated papers. The sensitive silver on the floated paper exists as a thin film upon the surface, and the finer details of printing are destroyed by the processes of toning, fixing, and sub-

sequent prolonged washing, whereas the aristo is flowed with a sensitized emulsion, and the details or finer shadings may be considered as extending to a greater depth and not so easily affected by the toning processes. The paper is also toned in less time than is needed for floated paper. Although burnishing improves the appearance of the print it is not as essential as in the case of the ordinary floated paper.

After the demonstration the Club voted to have an outing on Fast Day, April 4th, weather permitting.

At a January meeting it was voted to follow the example set by the Boston Camera Club, and other clubs, of illustrating their city by a set of lantern slides, the same to be accompanied by a descriptive lecture, and it was decided to give those clubs that desired it a glimpse of Ye Old Shoe Town, and also the two noted summer resorts of Swampscott and Nahant.

At this meeting a number of the members reported that they had negatives ready for reduction, and others signified their intention of contributing to the number.

Considerable interest was manifested by the members present, and after tendering its thanks to the President for the demonstration, the meeting adjourned until Tuesday evening, April 2d, when the Club will give a lantern slide exhibition. J. W. GIBBONEY,

Secretary.

ANNUAL MEETING OF THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

FIVE years ago, on March 28th, the Society was organized at Cooper Institute with a pledged membership of 30; last Tuesday evening, the 9th inst., at the fifth annual meeting, the Secretary's report showed the present membership to be not far from 240, with several applications awaiting action. Such a showing gives every assurance that the Society will increase in interest and membership as rapidly as the spread of amateur photography generally.

The President, Secretary and Treasurer read their reports on the condition of the Society. The Treasurer reported a balance on hand in the reserve fund of over \$500, and the receipts and expenditures during the year reached nearly \$4,000.

The Lantern Slide Committee made an interesting report of its work during the year and the great interest shown by members in exhibitions conducted by it. The Committee was re-appointed by the President filling vacancies caused by resignations. It now consists of F. C. Beach, A. L. Simpson, Frank F. Cobb, H. N. Tiemann and Frederick Vilmar.

The following ticket was unanimously elected:

President, Charles W. Canfield; Vice-President, David Williams; Secretary, Henry T. Duffield; Treasurer, J. E. Plimpton; Directors, James H. Stebbins, Jr., Clarence S. McKune, H. N. Tiemann, Frank F. Cobb, Louis B. Schram, William M. Murray, T. J. Burton, A. L. Simpson.

A few amendments to the constitution were

adopted, following which Mr. E. P. Griswold spoke on the Ferrottype, giving its history and several useful formulas.

A full report of Meeting will appear later.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—A. S. writes: Please tell me through the columns of the BULLETIN what I should do to obtain white high lights on aristotype paper. I tried to use it, and the result was the same as when old silvered albumen paper is toned—the whites have a sort of yellow, muddy appearance.

A.—There should be no trouble about obtaining clear high lights on this paper. You must use denser negatives than if albumen prints are made, to obtain the best results.

Q.—C. O. K. writes: Will you please inform me in your next BULLETIN if Pizzighelli paper comes prepared for immediate use; if so how long will it keep fresh?

A.—This paper comes prepared ready for use, and keeps indefinitely if preserved in the tubes containing chloride of calcium to keep it dry.

Q.—T. P. writes: Please tell me in your "Friend" column in BULLETIN how to convert an old ferrottype bath into a printing bath?

A.—Make bath just alkaline with ammonia; place in sunlight to precipitate organic matter; shake up well with china-clay, and allow to settle; pour off clear, and if bath is colored repeat the sunning and china-clay treatment a second time. After bath is clear, add chemically-pure nitric acid until just acid to test paper, and then enough silver nitrate to make up to proper printing strength. This latter can only be tested by making some specimen prints and judging from them if strong enough. Bath should be acid, not alkaline.

Q.—E. O. T. asks same question as above. The answer is the same.

Q.—L. R. writes: Is water condensed in iron pipes from a steam engine exhaust better or as good as melted ice, oil being used in the cylinder?

A.—We would not recommend water condensed from a steam engine for photographic

purposes. If it does not contain oil, it will probably contain the products of the decomposition of oil.

Q.—L. P. S. asks same question as T. P. above. Answer is the same.

Q.—A. D. writes: What is the quickest process to make collodion enlargements on porcelain from a card-size negative? I am using the solar, but it is very slow, and so very troublesome this bad weather to get a print.

A.—Use any good collodion, a good silver bath and the wet plate process. Coat porcelain the same as for negative work; use a copying box to enlarge, and tone with sulphide of potassium.

Q.—C. A. P. writes: Will you please inform me to what specific gravity 65 corresponds on photographers' hydrometers for use in silver nitrate?

A.—The figures on a silver-bath hydrometer should read grains to the ounce. That is, 65 means sixty grains of silver nitrate to the ounce of water.

Views Caught with the Drop Shutter.

We are glad to note that Mr. William P. Buchanan, of Buchanan, Bromley & Co., Philadelphia, has joined the noble army of married men. We tender our thanks for cards for "At Home" lately received, and wish the happy couple much joy and a long life together.

FROM Toledo papers we note that EZRA H. ALLEY has had conferred upon him the degree

of M.D. We congratulate Dr. Alley upon the well deserved honor he has received.

T. C. MOON, of Laconia, N. H., had a fire in his studio on March 20th, which damaged \$1,500 worth of property. The insurance was only \$800; hence his loss is considerable and we extend our sympathy.

THE NEWPORT ALUMINUM AND STEEL COMPANY, of Newport, Ky., are making pure aluminum and aluminum alloys, for all kinds of purposes. The pure metal and its alloys are remarkable in possessing wonderful lightness, combined with properties not possessed by any other metals. This new industry is important.

MESSRS. GILBERT & BACON, the well-known Philadelphia photographers, have equipped a new studio at 1030 Chestnut street. The opening days were March 18th to 23d, inclusive. We hope that the reputation they have obtained in the past will be eclipsed by the successes of the future, and we honestly believe it will.

SUN AND SHADE, No. 7, is fully up to its predecessors in the value and beauty of its illustrations. This unique publication is a far greater success than we ever dreamed it would be. A photographic record of events with no letter-press is certainly an original idea in journalism, and its utility is now beyond question. In the latest number of *Sun and Shade* there are six photo-gravures and two photo-gelatine prints illustrating modern engravings, portraits of celebrated men, and among other interesting scenes the ice palace at Montreal, 1889.

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Mrs. Benjamin Harrison.

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ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

APRIL 27, 1889.

Vol. XX.—No. 8.

THE PHILADELPHIA EXHIBITION.

“COME, draw this curtain, and let's see your picture.”

Every year photography is becoming more important as one of the fine arts. Men of science, men of leisure, even artists that wield the brush and pencil, are all becoming fascinated with the delightful, the wonderful results obtained by the physico-chemical manipulations that produce modern photographs.

Any one who saw the handsome exhibition at Philadelphia will acknowledge the truth of the foregoing statement. On the walls of the beautiful building devoted to the fine arts in the Quaker City was to be found every conceivable application of photographic processes, by almost every kind of devotee to the art. The lover of the wild and roaring ocean there saw him in all his fury in the wonderful surf pictures taken in various parts of the world, and with a faithfulness to nature that brush or pencil could never attain. The storm-cloud and the effects of the howling wind surging over the landscape were also to be seen, caught with the accuracy that only the photographic lens can secure. There also were to be found the more restful scenes of nature, babbling brooks, silent pools with brooding branches sheltering nooks where the finny tribe love to nestle. For those who love the majestic and grand, the mountain peaks of Sweden and Norway, the snow-clad Swiss Alps, or the Rocky summits of our own Western Highlands, were all faithfully and wonderfully delineated upon the walls of the exhibition. The scenes of home life were also not forgotten; the fire-side, the children at play, the household pets, the nook in the study, the art corner in the drawing-room, each and all had its representative pictures. Even our homes, and the buildings we raise as monuments of ideas and the thoughts of our fellow men, together with machinery and the various applications of photography to the methods and investigations of science, were to be seen, and in such a manner as to call forth the admiration of the spectator.

As each of these yearly exhibitions of the three Societies (Philadelphia, Boston and New York) comes around we are more and more embarrassed in the wealth of good material that we are called upon to notice. In the present exhibition we have a marked advance over former years, both in the quality and also in the number of pictures exhibited. We are also very much pleased with

the arrangement and display of the pictures, as seen at Philadelphia. This improvement is partly owing to the character of the building in which the exhibition was held. The Pennsylvania Academy of Fine Arts building is adapted to the display of pictures, and our Philadelphia friends were very fortunate in securing so good an exhibition hall. But what, in our minds, was a far more important factor in the admirable arrangement of the display, came from the painstaking and faithful labor of the Committee of Arrangements, especially Messrs. Bullock and Redfield. There is no doubt that to the labor of these gentlemen is due the very decidedly improved appearance of the walls, and the exhibition generally, over those of former years. There were no pictures below the medium line and none were given sky-room, which was the reverse at the two previous exhibitions. Of course something has been gained by the experiences of former exhibits; but mistakes are not always profitable, even to the managers of photographic displays.

Among the multitude of good pictures it is impossible for us to notice more than a few. We must confess that we saw much less poor work in this display than in those of previous years.

W. B. Post, of the New York Camera Club, had several excellent out-door portraits taken with foliage backgrounds, that were very effective and picturesque. One, a lady and gentleman standing by a fence in a field, was excellent.

J. L. Stettinius, of Cincinnati, had some exceedingly fine instantaneous photographs; one of the most perfect of which was a gentleman swimming with a laughing boy, entitled "On Papa's Back." "Pole Leaping" and "Yacht Pasque" were also very good.

John H. Tarbell, of New York, had some fine studies. "Darby and Joan," an old couple by a cottage door, was a fine composition; and "Two is Company," an old man and dog evidently much interested in each other, was equally good.

G. Harry Squires, of Plainfield, N. J., showed some gems of Catskill scenery with foliage work among the best in the exhibition. This latter effect was uncommonly fine.

A. G. Van Nostrand, of Boston Camera Club, had an excellent picture of Anastasia Light-house, Florida, which from its height (164 feet), and the peculiarity of the light in Florida, is a very difficult subject. Another good picture in this exhibit was "Foot of Rocks," Ausable Chasm, N. Y.

W. P. Atwood, of Lowell Camera Club, had four gems of scenery at Nantucket and Lake George, with particularly fine effects in the clouds. "Marblehead Rocks" and "Summer Afternoon, Lake George" were, in our opinion, the best of a fine exhibit.

George A. Nelson, of Lowell Camera Club, as usual, had an excellent exhibit. The beauty of the former work of this exhibitor is well maintained, and in some instances surpassed, in the present exhibition. "A Merciful Man," an ox team with an old and gentle looking driver, was a fine study; while the pictures entitled "Morning," "Noon" and "Evening" were scenes that would be the delight of any artist.

Edward Leaming, of the Society of Amateur Photographers of New York, had a fine exhibit which contained one picture of which he may be proud, Miss Lula M. Smith as Mary Queen of Scots. It was an excellent piece of work in every sense.

Professor H. A. Rowland, of the Johns Hopkins University, showed some excellent views of Norwegian scenery that were very beautiful; but his masterpiece was a new series of photographs of the solar spectrum made with his concave diffraction gratings. These are the most perfect pieces of photographic work in this department yet attained, and place America in the front rank of spectro-photographic research.

We cannot now notice many other excellent pictures and reserve this pleasure for our next issue. On another page will be found the report of the judges.

EDITORIAL NOTES.

PROFESSOR ROWLAND'S new photographic map of the solar spectrum is one of the greatest achievements in modern scientific photography. It has been made by the use of his beautiful concave diffraction gratings, and covers the spectrum from the extreme violet to the red rays as far as wave-length 6,950. The scale is three times larger than the well-known maps of Angström. The map is made in sections and was on exhibition at the Philadelphia Academy of Fine Arts. The definition and clearness of the work exceeds anything hitherto attempted in this line.

FROM Ottomer Anschütz, the photographer of Lissa, Posen, Germany, we have received a print and enlargement of his photograph of a "flying cannon ball." This marvelous piece of photography was made at the Grosenworks, Buckan, on September 12, 1888. In the print the flying ball is perhaps the fiftieth of an inch long, and the enlargement (about six times) shows the projectile quite distinctly. The rapidity of flight was 400 meters per second, and the time of exposure was 0.000076 of a second. The print shows a well exposed negative, and the result is a monument to Anschütz' photographic skill and the marvelous sensitiveness of modern dry plates.

THE Society of Amateur Photographers have just issued a neat little pamphlet of their list of members, which contains some excellent views of their library, dark room and lecture hall. It reflects great credit upon the Board of Management and gives an excellent idea of the conveniences offered by the Society.

THE Lynn Camera Club are busy making views illustrative of their picturesque town and the surrounding suburbs. These are to be used in illustrating a lecture entitled "Ye Olde Shoe Towne," with lantern slides, after the manner of the Boston Camera Club. The idea is an excellent one, and will be a source of pleasure and profit to any of our camera clubs who would do likewise.

WE have just received the first Bulletin of the *Associazione degli Amatori di Fotografia* in Roma, containing the Articles and By-Laws and a list of members. We wish them every success and hope that much good may result from the organization to the amateurs of sunny Italy.

THAT flourishing organization, the New York Camera Club, appears to be in full running order, and with this month commenced its regular Friday evening conferences. On the 7th inst. Lieutenant C. L. Bruns entertained the members and their friends with a paper on "Precise Photography," which appears

in full in our columns. On the 12th Mr. H. J. Newton explained the theory and gave a practical demonstration of collodion emulsion making; on the 19th Dr. Piffard exhibited some new methods of dark room illumination, and on the 26th Mr. Alexander R. Black, of Brooklyn, will give a stereopticon exhibition illustrating many interesting phases of life as seen with the aid of a detective camera.

Mr. Newton's remarks on the preparation of collodion emulsions were thoroughly practical and included full working directions, thus enabling any one who will employ reasonable care in his manipulations to be almost certain of success. He said: First take 100 grains of bromide of cadmium and 50 grains of bromide of ammonium and dissolve them together in a small quantity of water. Then evaporate the solution to dryness. This will give you a mixed salt much more soluble in alcohol than its separate constituents. This mixed bromide salt is kept for stock. If, now, you wish to make two ounces of emulsion, take 20 grains of the mixed bromide and put it into a dark amber bottle with 1 ounce of alcohol (Atwood's). Agitate until the bromide is dissolved. Then add 100 grains of pyroxylin picked into small particles and let this soak in the alcohol for a few minutes, after which add 1 ounce of ether. This dissolves the pyroxylin and the salted collodion is now complete. This may be immediately sensitized (as was done at the meeting), but it is better to allow the collodion to ripen for a week or two, or longer, before sensitizing. When, however, you are ready to sensitize, weigh out carefully 32 grains of silver nitrate and pulverize it thoroughly in a mortar. This is then carefully transferred to a test tube and 16 to 18 minims of water are added. After a little agitation the silver will have completely dissolved. It should then be added, a few drops at a time, to the 2 ounces of ripened collodion and thoroughly shaken after each addition. When all the silver has been added the bottle is set aside in a dark place for twelve hours, at the end of which time four or five grains of pure fused chloride of calcium is added. The object of this addition is to convert the slight amount of free nitrate present into a chloride; for if any free nitrate were left in the emulsion the plates would fog. Plates thoroughly cleaned in the usual manner may now be coated with the emulsion and exposed while wet or may be allowed to dry. The emulsion itself, if properly protected from the light, will keep indefinitely. Mr. Newton recommended the following developer for use with this emulsion: Water, 1 ounce; carbonate of soda, 12 or 15 grains; bromide of sodium, 1 grain; and pyro, 3 grains.

Mr. Newton also explained the method of preparing collodio-chloride emulsions, and exhibited both negatives and positives prepared by this method, which for exquisite beauty we have never seen equaled.

As before noted, the Camera Club proposes each Friday evening to present attractive features to its members, and we understand that all persons interested in amateur photography will on these occasions be heartily welcomed.

REPORT OF BOARD OF JUDGES AT PHILADELPHIA.

THE Board of Judges appointed to make the awards of diplomas for work at the Joint Exhibition of the Society of Amateur Photographers of New York, the Photographic Society of Philadelphia and the Boston Camera Club, held at the Pennsylvania Academy of the Fine Arts, Philadelphia, April 8 to 20, 1889, re-

spectfully report that they have carefully examined each exhibit, and make the following awards:

DIPLOMAS FOR SPECIAL EXCELLENCE.

1. For landscape or marine views—Harry Tolley, Nottingham, Eng., No. 524, "On the Lonely Shore."
 2. For portraits—Frederick Gutekunst, Philadelphia, No. 303, miscellaneous portraits.
 3. For genre subjects and figure compositions—W. W. Winter, Derby, Eng., No. 608, "My Mammy."
 4. For work by Ladies—Mrs. S. M. Cleveland, Philadelphia, No. 311, entire exhibit.
 5. For Enlargements—William H. Rau, Philadelphia, Nos. 340 to 343.
 6. For Lantern Slides—Professor Henry A. Rowland, Baltimore, Md.
- For applied photography—scientific or technical—Professor Henry A. Rowland, Johns Hopkins University, Baltimore, for photographic maps of the normal solar spectrum, second series, 1888.

DIPLOMAS FOR EXCELLENCE.

For Entire Exhibits—Frank M. Sutcliffe, Whitby, Eng.; William Parry, Shields, Eng.; J. P. Gibson, Hexham, Eng.; John Bartlett, Philadelphia; Charles L. Mitchell, M.D., Philadelphia; George B. Wood, Philadelphia; Paul Lange, Liverpool, Eng.; Robert S. Redfield, Philadelphia; Richard Keene, Derby, Eng.; Harry Symonds, Portsmouth, Eng.; S. W. Burnham, Lick Observatory, California; The Rev. F. C. Lambert, M.A., Cambridge, Eng.; H. A. Latimer, Boston, Mass.; A. K. P. Trask, Philadelphia; George A. Nelson, Lowell, Mass.; R. T. Hazzard, Philadelphia; Clarence B. Moore, Philadelphia; Mr. and Mrs. W. J. Anckorn, Arbroath, Scotland.

(Signed)

JOHN C. BROWNE,
GEORGE W. HEWITT,
XANTHUS SMITH,
FRED. B. SCHELL,
JAMES B. SWORD,
Board of Judges.

PHILADELPHIA, April 8, 1889.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

The cause of Black Edges on Old Gelatine Plates.—Testing the Quality of Black Cardboard.—Yellow Light for the Dark Room.—The Forthcoming Berlin International Jubilee Photographic Exhibition.—A New Developer.—Making Plates of a very fine Grain.

SINCE the introduction of dry plates numerous complaints have been made about the so-called edge-fog—that is, the blackening of the unexposed edges of the plate during development. On old plates this edge-fog reaches oftentimes a width of 1 cm., so that—particularly with smaller sizes—the whole negative becomes useless therefrom. The reason for this abnormal appearance was believed to be looked for in the defective cleaning of the edges of the plate. This may be true with such plates which show the black borders only on the old

edges and not on those with a fresh cut. Although insufficient cleaning without doubt causes the origin of the borders, I must by reason of recent tests accept for certain, that, whenever the black border shows all around, the paper used for packing the plates is the principal cause of their destruction. Last summer I made the observation, that some plates prepared by me on new and carefully cleaned glass, wrapped up in black paper, showed only a few weeks later large black borders during development, while other plates prepared at the same time and with the same emulsion, which had remained in the drying box, had no trace of black edges. Lately I observed, that plates packed between cardboard showed no trace of decomposition where the cardboard prevented them from coming into contact with the black paper, while the unprotected parts showed a wide decomposed edge. This demonstrated to a certainty that impure matters contained in the paper were the cause of the spoiling of the plates. To prove this I boiled a piece of this paper for a few minutes in distilled water and added a few drops of nitrate of silver solution to the filtered liquid. The previously weakly yellow colored solution became at once brown from the addition of the nitrate of silver and after a short heating a black-brown sediment appeared which was after a further test recognized as sulphide of silver. Another part of the solution was mixed with a few drops of starch paste to which were added a few drops of iodine. Only after several drops of the iodine had been added the solution was colored blue by formation of iodide of starch. A very diluted solution of hyposulphite of soda treated with nitrate of silver and iodine solution respectively, showed the same reactions; the paper was therefore contaminated with hyposulphite of soda. Hyposulphite of soda is applied a good deal in the manufacture of white paper under the denomination of "anti-chlor," to counteract the chlorine used for bleaching the paper; and black paper is probably produced from waste paper whereby the presence of the hyposulphite of soda can easily be explained. But it should also be remarked that some coloring matters, for instance aldehyde-green, are produced with the aid of hyposulphite of soda and contain sulphur which has a decidedly damaging effect upon plates.

Recently I obtained cardboard of a black color, which turned the pictures yellow shortly after they had been mounted on the same. A closer investigation showed that the coloring matter was the cause of it. Such defective card mounts can easily be tested by making a fresh paste and mixing the same with five per cent. of acetic acid. The picture is then mounted. If the cardboard is pure, the picture will remain unchanged; if impure, the picture will have yellow spots within twenty-four hours. I recommend this test to every photographer.

Since about a year a yellow light for the dark room, introduced by Messrs. Gädicke and Miethe, the inventors of the flash-light, has met with much favor. It consists of a Bunsen burner, into which soda is introduced. The light is intensely bright; but as the Bunsen burner contains yet some blue rays, a yellow chimney has to be placed over the flame. Still the light is six times as strong as that of a ruby lamp and much more agreeable to the eyes. But the chemical action of the yellow lamp is much stronger than that of the red one. Professor Weber found it to be four times as strong; but that does not matter, if the tray is covered during development and the plate is examined only for a few seconds from time to time. The plate can thus be developed without any disadvantage. I have lately developed in a room into which even white day-light entered, and I succeeded, by covering the tray.

Gädick says : "The principal question is, Is the light of the monochromatic lamp sufficient for the wants of the practical photographer? and this question is decidedly to be answered in the affirmative.

"The proof for this I can furnish, as for the last ten months I have even manufactured dry plates in this light, which have a sensitiveness unheard of so far. They are twice as sensitive as 25 degrees Warnerke, and they gave fully exposed instantaneous pictures in one-sixtieth of a second with Steinheil group antiplanat No. 3, diaphragm 4 (12 mm. diameter)."

The enlargement of negatives is now such an important affair that the dry plate manufacturers should endeavor to produce a plate of particularly fine grain. Bromide of silver differs very much in grain ; in the more sensitive plates it is coarser, in the less sensitive ones it is finer. Of particular importance is now this fineness of the grain for scientific photographic pictures ; and Dr. Lohse has published for this purpose the following interesting formula :

"While making a number of photographic investigations I came to the not uninteresting result that a considerable quantity of bromide of silver can be completely dissolved in gelatine, in such a manner that no emulsion results, but only an opalescent liquid, which has a reddish appearance in transmitted light, and in which, even with the microscope, no particles of bromide of silver can be detected. If gelatine plates are flowed with such a solution of bromide of silver, they appear transparent like glass, and it is not possible to develop upon the same a picture of any kind of density.

"If ammonia is present when mixing the three substances, gelatine, silver and bromine salts, the mass will form at once an emulsion, in which a grain can be recognized under the microscope. The separation of the bromide of silver also takes place if the plates, prepared with transparent bromide of silver gelatine, are exposed in a moist condition to the fumes of ammonia. In the latter case the formation of the grain is a very even one, and it is at one's pleasure to produce plates with a finer or coarser grain, according to the shorter or longer duration of the ammonia fuming. With consideration of the foregoing facts, I have employed the following process for the production of fine grained bromide of silver gelatine plates:

"Two solutions, A and B, are made:

A.

Gelatine.....	2 grms.
Nitrate of silver.....	1 "
Water.....	50 c.c.

B.

Gelatine.....	2 grms.
Bromide of ammonia.....	0.6 "
Water.....	50 c.c.

"In A the gelatine is completely mixed with the water by application of a moderate heat, and the silver salts, dissolved in a minimum of water, is only added after the gelatine has cooled off as much as possible, as otherwise the properties of the glue will be changed."

"A and B are mixed when still warm, and after a thorough good shaking they are poured into 200 c.c. of alcohol, to remove the nitrate of ammonia and the surplus of bromide of ammonia. This method of washing, of course, which I like to apply for small quantities on account of its simplicity, can be replaced by

any other in use. In the alcohol the gelatine will agglomerate together to a light spongy mass, which is soaked in water for some time, and finally is liquefied by heat. The volume is now filled up to the original one—in the foregoing case to 100 c.c.—and the flowing of the plates can proceed. As soon as the gelatine film has coagulated upon a plate, it can be exposed to the ammonia fumes in a suitable box or under a glass globe, but the bromide of silver will separate in not sufficiently fine grains. I let the plates, therefore, become thoroughly dry, bathe them for a short time in aqueous alcohol (equal parts of water and alcohol), and bring them in contact with the fumes of ammonia while moist, whereby the milky coloration of the film takes place very soon. It is not advisable to let the ammonia act for a very long time; a minute is almost sufficient, after which time the plates are arranged to dry. A longer action increases the grain.

“The sensitiveness of the plates is very insignificant, but they find application in all cases where there is no want of light, but where a very fine grain is required—as, for instance, in the production of microscopically small pictures, and in the reproduction of negatives, etc. It does also not exclude, that an increase of the sensitiveness of the plates may be successful. In the transparent state the emulsion is undoubtedly very insensitive, so that the preparation of the plates can take place by lighting the dark room pretty well, which is a great facility. The development of the plates I have effected with oxalate of potassium, but any other developer can undoubtedly be used also.

“The plates, although they have a prominent yellow sensitiveness and were exposed during their manufacture from two to two and one-half hours at 4 meters distance from the light of the monochromatic lamp, are perfectly clear. I have to remark, that the light, which falls directly upon the plates, passes through a yellow glass.

“If the monochromatic lamp is proof against this pretty severe test, it is so much more suitable for developing, where a much shorter time is generally required.

“Yes, it can even be applied for the development of color sensitive plates if a second glass is placed in front of the first one, remaining at a distance of 70 c.m. from the light. Impossibilities of course must not be demanded, and the generally necessary care must not be neglected; for it must be considered, that every light, even the red light, is actinic, and that in every case the plates should be left near the light for only a very short time, while examining them during development.”

All the leading circles are at present occupied with the preparations for the semi-centennial photographic jubilee exhibition. From all parts of Europe we have already assurances and promises of participation; and we calculate also upon the excellent productions of the United States, particularly if the house of E. & H. T. Anthony & Co. declare their willingness to collect all the exhibition goods and ship them together. They should arrive here by the 11th of August, as the exhibition commences in the beginning of September and lasts until the beginning of October. We want to show the progress of photography artistically, scientifically and industrially, and the productions of professional photographers, amateurs and men of science are equally welcome. The first artists and the best scientists are at the head of the enterprise, and marks of distinction will, of course, be bestowed upon those worthy of them.

Applications are received by me, Kurfürsten strasse, 124, Berlin, W. Prussia, Germany.

The new developers do not let us rest yet. The hydroquinone developer has hardly come into favor, and there is already another body announced, pyrocatechine, but which so far has not been approved.

Quite lately I received from the "Actien-Gesellschaft für Anilinfabrication" a new body, yet without name, which possesses surprising properties. It develops with a greater rapidity than hardly any other developer, and furnishes with half the time of exposure just as many details as hydroquinone will at ordinary exposure, so that we even succeeded in making an instantaneous picture at 4.30 P.M. with a Steinheil applanat. About further tests of this remarkable developer in my next.

BERLIN, April, 1889.

PRECISE PHOTOGRAPHY.

BY LIEUT. C. L. BRUNS, U. S. NAVY.

[Read before the New York Camera Club at a Meeting, April 5, 1889.]

PHOTOGRAPHY seems to be gradually passing from the tentative methods so as to include more scientific applications. The amateur of to-day is willing to endure a few formulas when he knows that they relieve him from heretofore variable conditions. Formulas based on differentials or integrals are out of place, but when simplified so as to come within mental application they are then most available. It does seem that many writers do not desire to give the simplest forms of mathematical photography, presuming, I suppose, that being so simple to themselves it is equally simple to others, and further simplification unnecessary.

There are certain conditions occurring in the practice of photography that do not vary, while others varying, the amount of variation is regular and known. If we could tabulate these constants and accept them as facts, better work would follow, as more attention could be given to the conditions which constantly vary.

We have, perhaps, no guide of more importance, both in a scientific sense and in its practical application, than the mathematical relation between the equivalent focus and the diaphragm. The equivalent focus of a compound lens of symmetrical combinations is the distance midway between the lenses and the front side of the ground glass, when a distant object is focused thereon, and the diaphragm used being a mean between the largest and smallest stop. While this method is approximately correct, and all that is necessary in ordinary practice, yet methods are given in almost all works on photography, by which it may be determined with accuracy.

Having obtained the equivalent focus, mark it on the lens mount. Measure carefully the diameter of each stop. Suppose the equivalent focus is found to be 6 inches, and stops $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ of an inch in diameter, respectively, divide the equivalent focus by the diameter of each stop, thus: $6 \div \frac{1}{2}$ or 12 or *f.* 12, $6 \div \frac{1}{4}$ or *f.* 24, and $6 \div \frac{1}{8}$ or *f.* 48. Mark these numbers, 12, 24 and 48, on their respective stops, and they indicate the number of times the equivalent focus is greater than the diameter of the stop, lineally. Again, since these numbers *f.* 12, etc., have no expressed term by which they may be called, and as they refer to

rapidity of exposure, the writer designates such expressions by the term focal rapidity, or F. R.

We have the following optical principle or theorem: The squares of the focal rapidities, $\frac{(\text{equivalent focus})^2}{(\text{diameter of stop})^2}$ are directly proportional to their times of exposure, which for practical purposes is sufficiently correct. Applying this theorem:

Suppose we have a lens of 6 inches equivalent focus stop $\frac{1}{2}$ of an inch in diameter, or F. R. 12, and requires one second for proper exposure; suppose the stop be changed to $\frac{1}{4}$ of an inch in diameter, or F. R. 24, what would the relative or corresponding exposure be? From the theorem we have thus:

$$\text{F. R. } (12)^2 :: \text{F. R. } (24)^2 :: 1 \text{ sec.} : x \text{ or, } (b) = \text{F. R. } 144 : \text{F. R. } 576 :: 1 \text{ sec.} : x \text{ or } 4 \text{ seconds; or, } \frac{1(f.r.)}{576} :: \frac{1(f.r.)}{144} :: 1 \text{ sec.} : x \text{ or, } (c) = \frac{f.r.}{576} : \frac{f.r.}{144} :: 1 \text{ sec.} : 4 \text{ seconds.}$$

Equation (c) is the form in common use, but as the form (b) is simpler the writer prefers it. Proceed similarly with all the stops, and determine the relative times of exposure, as compared with the largest stop, when its time is unity or one second. Mark these times on their respective stops, thus: For F. R. 12 mark one second; for F. R. 24, four seconds; for F. R. 48, sixteen seconds; and so on.

Again, if for a lens of 10 inches equivalent focus and stop $\frac{1}{4}$ of an inch in diameter, suppose for a given subject, plate, etc., it required four seconds to properly expose, how much exposure, subject, etc., being the same, must be given with a lens of 5 inches equivalent focus and stop $\frac{1}{4}$ of an inch in diameter?

$$\text{F. R. } (40)^2 : \text{F. R. } (20)^2 :: 4 \text{ sec.} : x \text{ or, F. R. } 1600 : \text{F. R. } 400 :: 4 \text{ sec.} : x \text{ or } 1 \text{ second.}$$

$$\text{That is, F. R. } 20 \text{ or } \frac{f.r.}{20} \text{ is four times faster than F. R. } 40 \text{ or } \frac{f.r.}{40}$$

I desire at this point to introduce an application of this optical principle which I think is new. It is a simple photographic method by which you may determine the time of a shutter or momentary exposure. It is more fully and clearly explained by an example. Let us suppose you are working with a lens of 5 inches equivalent focus and stop 1 inch in diameter, or F. R. 5, having the shutter set to some unknown but fixed speed, a momentary or so-called instantaneous exposure is made, which upon development is found to have been rightly timed or actinized. Required, the time of that momentary exposure.

Follow the above experiment with another exposure, using same lens and some small stop, by which the shutter may be dispensed with. Suppose the usual working stop for time work being $\frac{1}{8}$ of an inch in diameter or F. R. 40. The subject, plate, etc., being the same. It was found after exposure under these parallel conditions, and in all respects similarly developed, that two (2) seconds gave a properly timed negative or of equal actinization to the above shutter exposure. Hence from the optical principle we have $\text{F. R. } (40)^2 : \text{F. R. } (5)^2 :: 2 \text{ seconds} : x \text{ or } \frac{1}{8} \text{ of a second.}$ Thus the time of the momentary exposure is $\frac{1}{8}$ of a second. This experiment can be perfectly well determined by exposure from your window.

This time $\frac{1}{8}$ of a second, with equivalent focus 5 inches, and this fixed shutter movement, is equal in actinization and relative in time of exposure to the two

(2) seconds exposure above cited, and the ratio of two seconds to $\frac{1}{32}$ of a second or as $1 : \frac{1}{64}$, will be invariable, provided equal actinizations be secured on any one particular subject, whether that subject be any marine view or landscape. Therefore being invariable, thus a constant, mark it on the camera for future record. It is evident, that if the shutter speed is changed a new constant must be obtained for that speed, likewise, if the opening or aperture of shutter is in any manner changed. The conditions of this constant being $\frac{\text{equivalent focus, 5 inches}}{\text{diameter of stop, 1 inch}}$ and $\frac{1}{32}$

of a second, for the purpose of distinguishing let this equation be called the Equivalent Shutter Exposure. It is readily seen from this equation that if it is desired to increase the time of exposure it may be done in two ways—by relaxing the tension of the spring and cause the shutter to move slower, or to reduce the diameter of the diaphragm. In the latter case it may be changed to a known degree, and in this experiment will make differences in periods of exposure by changes in diaphragms. Thus the equivalent shutter exposure becomes

$\frac{\text{equivalent focus, 5 inches}}{\text{diameter of stop, } x}$ and $\frac{1}{32}$ of a second. This equation as changed is called for convenience The Undetermined Equivalent Shutter Exposure, in which x , the diameter of the stop, is to be determined.

Let us suppose the society has determined a number of equivalent shutter exposures for a series of defined views, among which we find that the equivalent shutter exposure for a particular marine view is F. R. 20, $\frac{1}{32}$ of a second. What must be the diameter of the stop x in the undetermined equivalent shutter exposure $\frac{\text{equivalent focus, 5 inches}}{\text{diameter of stop, } x}$ and $\frac{1}{32}$ of a second, in order that if exposed under parallel conditions an equally actinized plate or a properly exposed negative will result.

We have from the theorem before annunciated that F. R. $(20)^2 : \text{F. R. } \left(\frac{\text{equivalent focus, 5 inches}}{\text{diameter of stop, } x} \right)^2 :: \frac{1}{32} \text{ second} : \frac{1}{32} \text{ second}$. We have here all parts known in the proportion except x , the diameter of stop in the undetermined equivalent shutter exposure. Solving we find x equal to $\frac{1}{4}$ of an inch stop. The undetermined equivalent shutter exposure becomes $\frac{\text{equivalent focus, 5 inches}}{\text{diameter of stop, } \frac{1}{4} \text{ of an inch}}$ and $\frac{1}{32}$ of a second, and the equation is now the equivalent shutter exposure for that marine view. That is, exposing with a stop $\frac{1}{4}$ of an inch in diameter will give an equally actinized plate with the societies' standard, F. R. (20) and $\frac{1}{32}$ of a second, if taken under parallel conditions.

Regarding this optical principle of so much importance, and capable of so many useful applications, the writer has for the benefit of co-workers computed a table of Focal Rapidities from F. R. 2 to F. R. 64. Therefore having the time of exposure for any included F. R., the corresponding time for any other included F. R. can be taken from this table by simple inspection. An explanation and examples are appended to the table, also a method of determining the times of instantaneous exposures.

The relations between the equivalent foci and stops, now, is embodied in a table, and computations thereby dispensed with. In view of the facility by which comparisons between different lenses and stops are now rendered, it is

suggested that certain typical views, representing clouds, sea views, distant landscapes, near landscapes, without and with foliage, etc., having appended the date, hour, character of day, locality and its latitude, Focal Rapidity, principal focus of lens, duration of exposure, name of plate and sensitometer, character of developer, if moderately, slowly or quickly developed, with such remarks as suggest themselves, these being regarded as standards.

The amateur has immediately an approximate time of exposure for a similar subject, particularly if the known monthly variation is applied. He may trace his previous errors and narrow the limits between under-exposure and harmful solarization; while for those seeking technical knowledge they may determine the relations between near and distant landscapes, relative actinic intensities of light in different parts of the globe, and in similar latitudes in different parts of the year, for celestial photography, and other numerous applications.

Having carefully made some investigations, of which the following may be of service in connection with the table of Focal Rapidities. If on the 21st of June in latitude 0 degree or on the equator, the time of exposure required be one, or one second, then on the 21st of December (subject, plate, etc., being the same), the time of exposure would be the same, or one second; while in latitude 41 degrees north, which is about the latitude of New York City, on June 21st, for a given subject, plate, etc., it required one, or one second, on the 21st of December, subject, etc., being the same, it would require two and one-half times that time, or two and one-half seconds; while on the North Pole if it required one second on June 21st, it would require an infinite exposure to properly expose on December 21st. From these relations we may conclude, leaving out atmospheric conditions or local irregularities, that the difference between the times of proper exposure on June 21st and on December 21st becomes greater as the latitude increases. These differences should be tabulated by each photographic society for its home latitude, and for each month of the year. There are many tables published, but they are of little use if the locality and latitude are not given.

In reference to the minimum and maximum range of exposure on a particular subject, the writer has found it to be three and one-half times the minimum time; that is, if at noon and under most favorable photographic conditions, a particular subject required one second for proper exposure, then on some proximate date, during a northeast storm, sky overcast and raining, the time of exposure, subject, plate, etc., being same, would be three and one-half times (or three and one-half seconds) the time required when the conditions were most favorable. There are two conditions fairly established: 1st. That under parallel conditions, in this latitude, it requires at noon two and one-half times longer exposure on December 21st than on June 21st, to equally actinize a plate. 2d. The plate, subject, etc., being the same, it requires three and one-half times more exposure under most unfavorable photographic conditions than is required under most favorable conditions.

In conclusion, the writer desires to say a few words on the intensity of the sun's light and the power of illumination—not, however, in a scientific sense, but rather photographically. It is a well known fact that the atmosphere, under certain conditions, has a selective, absorbing power on rays of light, producing from yellow light that appearance that the source is red, and of white light that the source is yellow. This condition is in its maximum when the source of light is.

near the horizon, and on which rests a belt of thick, heavy and highly refractive media. This condition may exist even while the sky overhead is free and clear. These conditions are particularly applicable to the sun and doubtless its luminosity and intensity are much affected thereby. With the sky clear the before mentioned ill conditions practically cease at sea when the sun reaches an altitude of about (10°) ten degrees, while on land the ill conditions manifest themselves for a longer period, depending on locality.

The writer has observed that when the sun is not less than two and a half hours high, these ill conditions practically disappear, and the time of exposure, to properly expose for a distant landscape, is the same, sky remaining same, during the entire day, until the sun reaches an altitude two and one-half hours from setting. Therefore conclude that the intensity of the sun's light is the same between those intervals. For near views, however, the times of exposure become less as the sun approaches the meridian. In the near views the shadows become shorter as the sun increases in altitude, and as shadows become less, illumination increases. Thus at noon the sun's intensity as well as its power of illumination reaches a maximum, and the interval of exposure is shortest for near views. Therefore conclude that after the sun passes the refractive belt near the horizon the intensity remains the same until it reaches a similar point from setting, while illumination is dependent on the altitude of the sun and is greatest when on the meridian.

THE DETECTIVE CAMERA; A SUMMARY OF EXPERIENCES AND OPINIONS.

BY HARRY T. DUFFIELD.

(Continued.)

Please state your manner of using it (weak, normal or strong) in summer and in winter? The general custom is to begin with weak, and as soon as details begin to appear flow the plate with normal solution, and add, if necessary, either or both of the solutions as may be required. A. A. Adee: "The temperature of the solution is one of the most important factors. In summer it should be as cold as possible at starting, as it gets warm enough as the development continues. In winter it should be about 65 degrees, and stay so. I generally begin with a well diluted solution, and build up as required." Archibald I. Carson: "In summer I generally succeed in bringing the picture out with a weak developer; in winter, normal, warmed." A. C. Abbot: "Either method, with the above formulæ, will give good results. I prefer to start development with normal developer, and as soon as density is obtained get detail by treatment with dilute alkali. Potash or ammonia give equally good results."

Have you ever used, in detective camera work, ferrous-oxalate, hydroquinone or hydroxylamine developer? What has been your experience? The majority answer they have not used either of these developers. Richard H. Lawrence: "Have used all of them with perfectly satisfactory results." Albert H. Pitkin: "Prefer ferrous-oxalate for all work to anything else; have used many formulæ and always returned to my favorite, contented with it." Edward Leaming: "Yes; all kinds of experiences." Rev. Dr. Bolles: "Ferrous-oxalate gives me weak negatives; hydroquinone fogs." William E. Bond: "Unsuccessful with ferrous-oxalate; successful with hydroquinone." F. C. Beach: "Used ferrous-oxalate in 1884 with good results, but it was too slow and was difficult to get detail out in the shadows. Have used hydroquinone to a limited extent, but have found it much slower than pyro." William J. Hickmott: "Never used ferrous-oxalate after trying pyro and potash. I believe in using one developer—first, last, and always. Get a good one and stick to it until you can get your negative every time or most every time."

What improvements in the construction of the detective camera can you suggest?

A. C. Abbot, Boston (Mass.) Camera Club: "A method of construction so that operator could observe the whole field of the plate and focus at the same time that the exposure is made."

Hon. A. A. Ade, Assistant Secretary of State, Washington (D. C.) Camera Club: "The ideal camera would be one carrying two lenses, of 7 and $4\frac{1}{2}$ or 5 inches focus respectively, with an automatic arrangement to bring the plate to a fixed focus at the same time that the lens is changed. An automatic arrangement to bring a fresh plate or breadth of film into place after making the exposure, the shutter at the same time setting itself for a second exposure, would be a god-send. In other words, twelve pressures on the exposing trigger or bulb should expose twelve negatives, without the necessity of manipulating the internal arrangements, either by the clumsy process of opening the box or by working slides, buttons or levers on the outside. A strong spring, wound up at starting, could do this. A figure, seen through a slot, could visibly register the number of exposures made. A thoroughly self-contained, automatic camera could be disguised in an endless variety of portable cases, and used without attracting attention, and so justify the name of a 'Detective camera,' now so grossly misapplied in nearly all instances."

George Marshall Allen, Society of Amateur Photographers of New York: "A swingback that would work automatically when camera is tilted."

Robert Baker, Society of Amateur Photographers of New York: "A very difficult question to answer. A detective camera, to be useful, should not have any plate holders, but should be so constructed that it carry within itself at least two dozen plates, and so arranged that these plates could be easily transferred from one part to another of the camera, with a slight movement of the box. Provisions for focusing lenses from 4 inches to 8 inches. A great luxury would be a movable or sliding focusing screen that could be brought into use in a moment."

Miss Catharine Weed Barnes, Society of Amateur Photographers of New York: "My objection to the detective camera is not being able to focus as sharply as with my regular view camera."

F. C. Beach, Society of Amateur Photographers of New York: "A detective camera should have a shutter of positive movement, balanced to prevent excessive shock, yet capable of moving fast enough to take a trotting horse passing the camera at right angle to the axis of the lens, without blurr of image. Plate holders and slides should be dispensed with and means provided for bringing the sensitive surfaces into position rapidly. There should be provided temporary means for preventing the light striking the plate when the shutter is set or a self-shutting shutter arranged. Special devices are needed for easily releasing the shutter without jarring the camera at the instant of exposure."

Sydney Bishop, Society of Amateur Photographers of New York: "1. That they be so arranged that at least six plates can be exposed without opening the box. 2. That the shutter can be timed accurately. 3. That it can have a practical double swing. 4. That the finder is actually in proportion to the size of the plate and absolutely correct in position. 5. That the bellows have freedom enough in movement to take a wide angle or rectilinear lens."

The Rev. E. C. Bolles, D. D., Society of Amateur Photographers of New York, "What I want for my own work: 1. A camera to carry fifty films (the new celluloid), with certain and rapid means of exposing them in succession. I prefer these films to roll holder paper or films, and find that they work as well in the detective as glass plates. 2. Some easy and satisfactory way of focusing the image up to the very instant of releasing the shutter. The arrangement for focusing by estimating distance has been very unsatisfactory in my hands, and I invariably lose the view that I want the most and 'estimate' for most carefully. A camera thus fitted up needs no 'finder,' of course. 3. A shutter-release at once firm and delicate, not to be set off by a jar, and yet working so easily that you do not move the camera in operating it."

Wm. E. Bond, Society of Amateur Photographers of New York: "Any-

thing that will contain a satisfactory substitute for glass plates, in a roll or otherwise, in quantity sufficient to make twenty-five or fifty exposures without opening camera to change holder, and consequently will be more light-tight than present cameras and holders. Also a focusing finder which will change as the camera bellows change, so as to enable one to focus on an object instantly by looking in the finder."

Frederick Bruce, Society of Amateur Photographers of New York: "The shutter should work in the center of the lens or back of it; a more noiseless shutter would be advisable."

William A. Bullock, Photographic Society of Philadelphia: "Slide to close the two finder eyes of camera when not in use. Shadowing hoods to the finders to keep the sunshine off the ground glass of same when sun is shining over your back or overhead. To have the top of the lid divided and hinged, so that you can introduce a holder quickly at any focus, without opening entire camera box, and a means of withdrawing quickly the holder other than by your finger nails. Also an indicator to show whether or not the shutter is set without having to try the same. To have drawn on top of camera lines showing the angle of view included by lens, so that without use of finders you can be sure to have an object on the plate—a very necessary thing in quick snap work on the streets. Also a small roll holder to slide in place of plate holders. The present roll holders make the camera too bulky."

E. J. Carpenter, Cincinnati (O.) Camera Club: "Too many to write down this evening. I don't think the perfect detective camera can ever exist, except in the imagination; it requires 'too many more improvements,' many of which conflict with one another. My 'detective' and other camera experience has been quite varied, and has taken all my leisure time since 1881; but it appears to me that I have mainly learned how much there is to be done in this direction. There is a wonderful fascination about the work, however."

H. M. Grisdale, Society of Amateur Photographers of New York: "One that will take lens from 5 to 8 inches; carry at least two dozen glass plates; set shutter and release from outside of box; expose plates without opening box or drawing slides; no external brasswork; and lock so that it will be impossible to meddle with it without key; color, dead black."

W. J. Hickmott, Camera Club of Hartford, Conn.: "Make it less complicated, and so that it can be used instantly. When I need my detective most my experience has been that there is not time to work a complicated camera. It usually happens that by the time I am ready to shoot, the effect I particularly wanted cannot be obtained, the game has got out of range. One cannot usually sit around all day waiting for good things. They come suddenly and unexpectedly, and must be caught on the fly to be worth getting. This cannot be done if the camera will not admit of being worked quickly and easily. By the time a lens was changed, a swingback adjusted, the shutter regulated to a minute fraction of a twentieth part of a second, the slide drawn, etc., even a rheumatic mud-turtle would have crawled out of sight and been lost forever. My experience points only in one direction, viz., to the need of extreme simplicity in construction of the camera; a fixed focus; a good shutter that will let in lots of light when open and none at all when closed; some means of pulling the slide without having to open the box, if possible; a flexible film that does not need stripping; and when these are provided it will be easy and pleasant work to get good pictures with a detective camera."

John Leshure, Springfield (Mass.) Camera Club: "I would suggest that the bellows of the camera should be made of longer draw, so that objects less than 8 feet could be photographed readily, and perhaps some copying done. The shutters on most detective cameras do not have the proper shaped opening, and I think that a shutter which works between the lenses is preferable to most of the shutters now used. I would also suggest that the lenses should be of longer focus than are generally used, say $7\frac{1}{2}$ -inch equivalent focus for a 4 x 5 plate. The ways on which my camera slides are made of soft wood, which in summer swell and make focusing almost impossible. If these were made of brass, the camera would work easier."

William H. Murray, Society of Amateur Photographers of New York: "Some invention to enable one to take many pictures without having to change plates or films, to avoid the weight of glass and yet not have the complication and expense of the roll holder. I think the celluloid film, and the promised contrivance for carrying the same in one holder to the extent of about four dozen films, will solve the problem."

Isaac T. Norris, President of the Amateur Photographic Society of Baltimore (Md.): "If the future of plates is to be the ivory film, we want a case holding, say, twelve films, separated by, say, ferrotype sheets, so that a spring may push one at a time up into focus and make a dozen exposures at once. With all my admiration for the detective and after three years' use of the same camera, I am the more convinced that instantaneous work is only an episode in the work of the amateur photographer. Time pictures are the cream of the camera, and however careful to focus with the detective there is that difference between the two kinds of work which adds to the richness and depth of the time picture."

Albert H. Pitkin, Camera Club of Hartford (Conn.): "Dispensing with all clap-trap attachments. Less bulk and weight."

Charles Quartley, Baltimore (Md.) Camera Club: "A camera in which can be carried films or other flexible plates without the necessity of independent plate holders, where no stripping would be necessary, would be the most desirable feature of any improvement that I could suggest."

A lady amateur, Worcester (Mass.) Camera Club: "A lens which would remove any necessity of taking any focus. Guessing at your focus is very unsatisfactory in my experience, and it is very inconvenient to have to go through the operations necessary to look through your ground glass and take an accurate focus. The plate on which handle of my focus works is marked 6 to 10, 60 feet, and experience enables me to be pretty accurate; but I have found several pictures ruined by being out of focus when I guessed at the distance being about 25 or 30 feet. I saw an English (?) lens this summer that entirely obviated this difficulty. Any object at a distance of 10 feet was in perfect focus, likewise any object at a distance of 100 feet or more. This seems to me to be the chief fault and annoyance of a detective camera. I think also an arrangement by which you could carry more than three plate holders in your box would be a great improvement. I can carry but six plates in my box, and any carried in any other way run the risk of being injured unless one gives one's undivided attention to them. I ruined many such this summer in going off for the day, when I wanted to take many pictures and carried ten or twelve plate holders in a bag. Of course it would add somewhat to weight of camera box, but I should think six plate holders might be carried without inconvenience."

Edgar Richards, President of the Washington (D. C.) Camera Club: "Not having any experience with the commercial varieties, I can only state what I find desirable and have adopted in my own models. The box should be light, rigid and strong. All parts to be easily accessible with a key. At least one dozen plates in six holders, plates to be carried in the box. The front of the box to have a hard rubber shutter, or cap, properly speaking, which covers both lens and finder, and by one movement uncaps both, so that whenever you see an image on the ground glass of finder you may be sure the large lens is exposed. For the vertical finder I have a separate cap, but as this is seldom used the habit of moving the large rubber cap is not forgotten. Front of box to hinge and lock, allowing tension of shutter to be adjusted, if necessary, for slow work. Top of box provided with handle, leather. In front to have a piece of plate glass, hinged, and closing level over pointer attached to lens shutter. Glass to be marked off with a diamond scratch into distances for 10, 15, 20, 30, 40 feet focus. Ground glass of horizontal finder to be at side, and protected from direct light by hood, right-hand side. The thumb screw for moving by rack and pinion. The shutter and lens to be beveled. Door running the length of bottom of box, provided with lock, as compartment for storing extra holders. Small door, with lock, for the introduction and withdrawal of holder at back of camera.

Vertical finder. Back, locked door, width of box, for focusing when required. Left-hand side perfectly plain. Bottom string release to shutter. The shutter can be set, and the diaphragms rotated, through plate glass opening on top of box. A vertical pointer is screwed into center of shutter, and work smoothly beneath the glass. The exact distance for which the lens is in focus is thus always indicated, and permits of the focus being rapidly changed without disturbing the position of the box while viewing the object in the finder. The center part of each plate is marked on the finder, which is a great convenience. The rack and pinion have a movement of $1\frac{1}{4}$ inch, so that a great range of focus is provided for."

Major George Shorkley, U. S. A., the Society of Amateur Photographers of New York: "That the focus be so arranged as to permit the use of the longest and shortest lenses, adaptable to the size of the plate, and to be quickly adjusted from the outside. A lens mount adjustable for moderately narrow and for wide angle lens. Some manner of hood or cover over the aperture in front of the camera, to be arranged to work automatically with the shutter as well as independently of it. It is presumable that all that one can suggest as real improvements have already been achieved by some one, and were all the best in one and the same camera, it would leave little to be desired; but unfortunately cameras, like other appliances, have patents upon them, and different stock houses have control of the excellencies."

Charles Simpson, Society of Amateur Photographers of New York: "1st. Better mode of concealment than anything now in the market. In fact, I know of no detective camera that cannot be detected on sight—would recommend a satchel as mode of concealment, but not cumbersome. 2d. Means of removing the camera proper from the box or place of concealment without loss of time, for the purpose of mounting it on a tripod for landscape work. 3d. Arrangement for changing lenses without loss of time and attracting attention. 4th. Rotary stops for the lenses and for instantaneous exposures. 5th. Larger finders, with lenses to correspond with the increased size of the finders. 6th. Swing back so adjusted as to swing from the center of the vertical side of the ground glass frame."

A. L. Simpson, Society of Amateur Photographers of New York: "The general fault that I have found in detective cameras is the fact that the lenses do not cover with large opening the plate called for, and in consequence it is difficult to obtain a fully exposed plate of any subject except in very bright light. If, however, a much larger lens than was necessary was used, you could open it fully and have a finely cut and fully exposed plate, and be able to take an object much further off in consequence of the focal length of the lens being longer. Of course this would necessitate the box being made a little longer; but what I think desirable is, that the result would be much better. The most interesting objects for the detective box are studies of every-day life, and as in many cases they keep pretty well in the shade, etc., the foregoing remarks are made applicable."

James H. Stebbins, Jr., Society of Amateur Photographers of New York: "I would suggest some simple means of carrying quite a number of plates, and some device for changing them conveniently in the open air. In this way a large number of plates could be carried, with but few plate holders."

E. Terry, Society of Amateur Photographers of New York: "The different parts requiring attention—focus, time, etc.—are too scattered; they should, if possible, be so placed that they can all be seen at a glance."

W. T. Wintringham, Brooklyn Academy of Photography: "Should I ever build another for my own use, I would put in two shutters; one, having a range from $\frac{1}{100}$ second upward would be placed between the lenses; the other, with, if possible, a range from $\frac{1}{100}$ downward to, say, $\frac{1}{10}$, would be placed in front of the lens, and act also as a hood. What is wanted more than anything else is a plate holder for the new films capable of carrying a quantity—two or three dozen—in small space, and some arrangement whereby they can be quickly changed."

Ellerslie Wallace, of the Photographic Society of Philadelphia, answered the

questions, but unfortunately they were received too late to be used in the foregoing part of this paper. In answer to the last question, says: "None. But I can and do urge a rational and careful selection of subject; not the haphazard exposing on anything and everything, irrespective of good or bad light, and suitability or unsuitableness of the thing photographed. I urge that the operator 1st should know what he has to do, and 2d, should be provided with the means of doing it. By this I mean a fair-sized plate, not too rapid; a shutter, not too rapid; a good finder on the box, and pluck enough on the operator's part not to attempt doubtful or poor subjects, unless, indeed, he is working for amusement only."

TWO OPEN LETTERS ABOUT PHOTOGRAPHY.

BY MISS ADELAIDE SKEEL.

DEAR ? —I want to ask your advice about buying a camera. Do they cost much? Does photography take much time? Is it hard to learn? I don't know a thing about anything, but am ambitious to do it all myself because people say that's the fun of it, and besides professionals are so dreadfully jealous that they always spoil amateur work in the finish. Haven't you noticed how much nicer they make their own look? I don't expect to go extensively into the business, only just family portraits, and views when we are off for the summer, and interiors, and maybe flash-light pictures in dull winter evenings. Finally, is it really nice to do it? Will I enjoy it at all, do you think? R.S.V.P. soon, and believe me

Always yours,

DEAR ———.—How much does a gown cost? Does it take much time to make one? Is it hard to learn how? And finally, is it nice to make them? Your questions are about as comprehensive as mine, but to be serious I will answer as well as I am able :

First.—A camera costs from twenty-five cents to a thousand dollars, and while you can sometimes get a tolerably clear, sharp picture from a ten-dollar outfit, I should not advise you to use poor tools permanently. Bargain hunters in photography usually buy dear, so I beg you to visit or send for the catalogue of some reliable stock house before you waste money in toys. If you do not know the difference between a stop and a lens, or between a tripod and a focusing cloth, not to mention the intricacies of rigid beds, adjustable fronts, patent swing-backs and iris diaphragms, it would be wise to borrow a camera of a friend and take an object lesson. Here I venture to say that, in my humble opinion, borrowing does not dull the edge of photography, nor lending either. Be both borrower and lender; for such is the Free Masonry of the art, that every one is willing to help another along this sunny road. If you cannot borrow a ten-dollar outfit buy one, and when you have passed the experimental stage, sell it at half price or give it to some other beginner. We are all poor relations in photography till we have blundered for a while. It is best to begin with small plates; but when you come out of your chrysalis state, should your enthusiasm last, open your purse wide and spend at least twenty-five dollars on your lens and what you choose for the rest of your apparatus. With the present facilities of enlarging on bromide paper, it does not seem necessary to have a particularly big plate—5 x 8 is an awkward size, and 8 x 10 rather cumbersome. I use 4½ x 6½, and like it; but more of this later. Get the best you can afford in lens and camera, then learn to use both to their best advantage.

And, is it hard to learn—does it take much time? You tell me that you only wish to attempt a little, and then define that little so that it covers the whole field of the art. Forgive the copy-book aphorism, if I remind you that to do a little well in any art implies a large reserve force of knowledge, and to gain that knowledge one must work hard and long. To be sure, a success at the outset seems to contradict this theory; but how rarely one's second or third attempt proves equally happy? It seems to me that this fatal facility of beginners is a bane to progress, unless one is uncommonly astute. It looks as if we knew it all, when by chance we make a hit; but, alas! we are only blunderers till we study the reasons of our prize pictures and our failures, and often remain blunderers after most exhaustive research. Yes, it takes time, a life-time, to learn how.

Finally, Is it really nice to do it, and will you enjoy it? Do you think the gift of the fairy-eye enjoyable? This is what photography is to the dullest of us, and to the artistic doubtless much more. It makes dusty wall-sides interesting; it calls us to look at that bunch of burdock bordering the familiar path; it stops us in a crowded street to note a takeable group of ragged children; it teaches us to study every face from the best point of view; it leads us hither and thither to see this and to see that—it is the unseen playmate that is sure to be present at home and abroad. Do you like such a companion? It seems nice to me—and so I end my letter. Yours sincerely, ?

[From *Photographische Correspondenz*.]

THE ANILINE PROCESS.

BY WILHELM WEISSENBERGER.

THE purpose of my present explanations is to give a clear picture of the Lichtpaus process known under the name of "Aniline Process," and to make you acquainted for the first time with the methods invented by me with acid sulphates and bi-acid phosphates of alkaline salts, besides the new carriers of oxygen here applied, manganous sulphate and chloride of magnesium.

The cheapness, durability and the absolute exactness shown by unwashed copies after development were, besides the high chemical interest possessed by the process, the reasons which prompted me to a close study of the process.

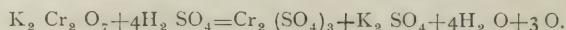
Aside from this we possess at present no Lichtpaus process which with equal quality of production is as simple as the aniline process and furnishes dark lines upon light ground.

The aniline process has been worked repeatedly, as described in Dr. Eder's Handbook of Photography, page 248.

My problem was to explain the chemical process so as to determine the most favorable proportions of mixture for the chemicals applied.

If paper is spread with a solution of bichromate of potassium in diluted sulphuric acid or phosphoric acid and exposed after drying under a diapositive, the bichromate of potassium will quickly decompose at the lighted parts into the normal potassium salt, and the chromium salt of the acid employed, with loss of oxygen. At the covered parts this process will proceed much slower, but sufficiently quick to oxidize in the fuming box the aniline vapors to aniline black after completed exposure.

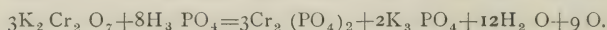
According to my observations the highest sensitiveness of light as well as the quickest oxidation in the fuming box by application of sulphuric acid is therefore obtained, if so much sulphuric acid is taken that normal sulphate of potassium and sulphate of chromium can form, according to the formula :



A formula corresponding with these proportions is:

Bichromate of potassium	10 grams.
Concentrated sulphuric acid, density 66° B.....	13.3 "
Water.....	100 c.c.

For the application of phosphoric acid there exists the formula :



or

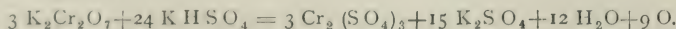
Bichromate of potassium.....	10 grams.
Phosphoric acid (20 per cent. density 1.117).....	122 "

In general is to be remarked that a larger quantity of acid will increase the light-sensitiveness. The contrary is the case if the quantities are reduced, and the process will be slower. In this case also the pure chromium compounds cannot form, but some chromate of chromium will form alongside of them, which is easily recognizable from the yellow coloration.

It is of importance in the process with free acids, that according to my experiences, it can be executed without oxygen carrier.

The penetrating of the liquid into the paper can hardly be avoided by preliminary preparation with gum or paste, but is by stretching a piece of flannel over a squeegee, and with this arrangement distributing the liquid quickly over the surface.

This disagreeable penetration of the liquids into the paper pulp prompted me to look around if it was not possible to replace the free acids with bodies of similar proportion, not having this bad property. Sulphuric salts were the next I thought of. A test confirmed the correctness of my supposition. With application of manganous sulphate as oxygen carrier the process proceeded smoothly, but the acid sulphate of potassium showed no less disposition to penetrate deeply into the paper. With a little skill this difficulty can be easily avoided, and for this reason I give the formula again which served theoretically and as a practicable prescription :



Bichromate of potassium.....	10 grams.
Acid sulphate of potassium.....	45 "
Sulphate of manganese.....	4 "
Water.....	150 c.c.

It was natural to pass from the acid sulphate to the acid phosphoric salts, and I believe I have discovered in these the most applicable substances. Double acid phosphate of soda is to be had in market, and it can also be made by saturating 980 grams phosphoric acid of 20 per cent. with 286 grams crystallized soda, and crystallization.

The aniline process, which by application of acid salts cannot be executed without oxygen carrier, offers the least difficulties with the acid phosphate of soda, the latter penetrating only very slowly into the paper. In this case the

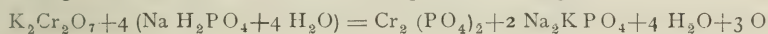
chloride of magnesium only can be employed as oxygen carrier, the sulphate of manganese producing a precipitate with the double phosphate of soda.

While the method with the acid sulphate of potassium furnishes the lightest ground (light blue), the papers made with the acid phosphate of soda are the most sensitive ones.

In the two last methods I have spoken of oxygen carriers. In chemistry we understand by this a number of bodies, in whose presence the oxidation of another body is considerably accelerated by a third one. It is supposed that these bodies at first absorb oxygen and then emit it again. Lothar Meyer (Humboldt, 1888 : Third Number, Report of the German Chemical Society) furnishes proof of this, that metals by passing easily from one degree of oxidation into another, prove the most effective oxygen carriers. That even magnesium acts as oxygen carrier leads us to conclude that this metal has also a tendency to the formation of sub-oxides, although such salts have not been produced yet.

The above-mentioned oxygen carriers were recognized as such first by L. Meyer, and I was the first one to apply them in the aniline process.

For the employment of bi-phosphate of soda the following proportions, corresponding with the formula below, have proven to be good :



or

Bichromate of potassium.....	3 grams.
Acid phosphate of soda.....	8 “
Chloride of magnesium.....	3 “
Water.....	40 c.c.

The paper, whether prepared after one or the other method, is exposed until the ground shows an even green color (five minutes in the sun, half an hour in the shade). After this it is placed in a box with double cover. The inner cover carries on its lower side two strips of cloth, of which the one is soaked with a few drops of aniline and the other with water. But care has to be taken that none of the liquid drops upon the prints in the case. It may also be mentioned here that the steam is absolutely necessary for the strong development of the picture. As long as the box is new it is advisable to coat the inside with aniline oil, as otherwise the wood might absorb all the aniline vapors, and the prints would blacken very slowly or not at all.

The picture appears in dark green-black lines in from five to ten minutes. After washing they will become blue-black. If indifferent about the color of the ground, the copies can be used as taken from the fuming box. Otherwise one is enabled, by washing and subsequent bathing in a five per cent. ammonia solution, to reduce the ground tone considerably. Five per cent. muriatic acid dissolves the phosphate of chromium completely, while the sulphate of chromium is insoluble in this solution.

Finally, it may be remarked that great care has to be taken in the selection of the paper to be applied. Paper containing wood fiber is decidedly to be avoided, the same coloring brown in the fuming box. The wood contained in the paper can easily be proven by a solution of phloroglucin in diluted muriatic acid. If such a paper is touched with this solution it will color light to blood red, according to the quantity of the woody matter.

A solution of sulphate of aniline in water colors all papers containing woody matter yellow.

I have used the old chemical expressions to make it more comprehensible to all photographers who are acquainted with the old chemical school. But I could not do without the new formulas, my mind and way of thinking being too closely allied to them.

THE EFFECT OF ELECTRICITY ON DRY PLATES.

BY F. C. BEACH.

[Read before the Society of Amateur Photographers of New York, March 12, 1889.]

I WAS much interested a short time ago in an account of a demonstration given before an English society by a Mr. F. Greene, wherein he intended to prove that a fac-simile of a coin could be impressed upon the moist film of dry plate by the action of a current of electricity passing between the terminals of a battery one of which was immersed in an acid solution and the other connected with and rested upon the coin laid on the film of the plate, the latter being also immersed in the solution.

After the current passed for a short time, the coin was removed and the plate put into a developer. Soon a distinct negative image of the coin appeared. The experiment showed that by electric action and without the aid of light an impression was made.

Knowing from some experiments made by a friend of mine, Mr. John R. Paddock, of the Stevens Institute, on the electrical conductivity of the bromide film of gelatino-bromide paper, resulting in proving that it was nearly a non-conductor, I hesitated to believe that the result obtained by Mr. Greene was entirely due to direct electric action, but imagined that it might be the result of some secondary effect induced by the electric current.

With a view of investigating the subject further, I invited Mr. Paddock to carry on a series of experiments under my direction, and supplied him with a dozen $3\frac{1}{4} \times 4\frac{1}{4}$ gelatino-bromide and also the same number of gelatino-chloride plates, the latter being of English manufacture.

He has recently handed me a report of some of his experiments which is substantially as follows :

FIRST SET OF EXPERIMENTS.

A bath of muriatic acid, 2 drams; water, 10 ounces, was first made. Two gelatino-chloride plates were placed in the bath in a horizontal position, films upward, and on one rested a silver half dollar coin, and on the other a silver dime. The battery consisted of five Leclanche cells, connected in series. The electric current was then passed through the solution for thirty seconds, from the positive platinum pole in the solution to the negative platinum pole on the coin. After keeping the plates in a pyro and potash developer for from ten to twenty minutes the image of the coins was faintly discernible. Plate marked No. 1 shows the result. Merely a faint outline of the coins will be observed.

A third gelatino-chloride plate was immersed in the solution having the coins resting on the film, but no current was passed through. No impression was obtained on development.

A fourth plate of the same brand was suspended film side downwards, horizontally, in a bath of water. A rubber tube was carried under the solution until the mouth of it was one-fourth of an inch away from the center of film. Then a

current of hydrogen gas was sent through the tube, and in emerging at the mouth gradually spread over the film.

When placed in the developer the plate turned a deep black color over the entire surface.

SECOND SET OF EXPERIMENTS WITH GELATINO-BROMIDE PLATES.

The plates were all immersed in a muriatic acid bath as before, and connected in the same way. On the first plate was placed a half dollar silver coin having the edges and one face protected with wax. The unprotected face was placed in contact with the dry film, and cemented at the edges with wax, and then immersed in the acid bath, the negative pole being connected to the coin. The current could only act on the under side of the coin next to the film. The current was then passed through for two minutes.

In raising the coin from the plate a small portion of the solution worked in under the edge, which appears in the peculiar hook appearance shown in the resulting disk; but prior to immersion in the developer nothing was observed on the plate. After development, for several minutes, a dense black disk, with a faint marking of the dots on the coin, was obtained, but it was nothing like a satisfactory image or fac-simile of the coin. In plate No. 2 the peculiarity of the disk will be observed.

Other coins of copper, a German coin (alloy 25 per cent. of copper) and an engraved copper plate resting on the film, with the electric current passing as before, were tried, but on being placed in the developer no impression appeared.

A third set of experiments included the immersion of chloride plates in a chloride of ammonia bath, using the same electric current and silver coins as above, but the results were not as satisfactory, only indistinct, blackened impressions appearing during development.

A plate was moistened and coins of various kinds pressed down upon the film. On development the impressions came out as good as when no electricity was employed.

Plate No. 3 shows the effect very clearly. It should also be mentioned that if a chloride or bromide silver film be stripped from a support and be subjected to a current of electricity passing directly through a cross section, the film will blacken at the negative pole by reason of the silver salt in the film.

The opinion of Mr. Paddock and myself is that the blackening effect produced in the film is the result of the reducing action of hydrogen gas generated in its nascent state, in contact with the film by the current of electricity passing between the two poles, and not to the current alone, as stated by Mr. Greene.

This he in part proves by causing a stream of hydrogen gas to impinge against the film, immersed in water; when developed the film blackens precisely like the disk obtained with the waxed coin.

Passing next to the effect of a high tension current (such as is obtained by an induction coil) on a dry plate, I have been much interested in an article by J. Brown "On Figures Produced by Electric Action on Photographic Dry Plates," published in the *London Philosophical Magazine*, and reproduced in the January, 1889, issue of the *American Journal of Photography*. In photographing the discharge between the electrodes of an induction coil, Mr. Brown was led to further experiment on the effect of the current when applied directly to the film. He obtained some interesting results, the most important of which was the discovery

that an induced current so slight as to be invisible to the eye produced an impression on the film of sufficient strength to be developed out.

He says: "The foregoing results would go to show that actual disruptive discharge over or in the film is not needed to produce an effect visible on development, but that the figures and markings are produced partly, at least, by direct electric action on the sensitive film, without the intervention of a visibly luminous action, or what would be usually understood as a purely photo-chemical cause. Possibly further investigation may show that we have here a new kind of experimental evidence on the relation of electricity to light."

It is presumed the experiments were carried on in absolute darkness, so that the eye might easily detect the least trace of the inductive current. Nothing in regard to this, however, is stated. If a faint red light was used, it might prevent the indistinct electric sparks from being noticed. Plates of extreme sensitiveness were employed, and it is possible they may have been impressed with the faint light not seen by the eye.

A short time ago, with the assistance of Mr. George M. Hopkins, of the *Scientific American*, I tried a few experiments, more especially with a view to determine first what the actual electrical resistance of a section of an undeveloped and developed gelatino-bromide film is; and secondly, to satisfy myself as to what effect an invisible induced electric current has on a wet and dry surface of a gelatino-bromide film.

First, then, I prepared two sections of plates of exactly the same length and width (4 inches long by 1 inch wide), wrapping tin foil around each of the ends, and marked respectively *A* and *B*. *A* is the developed and fixed section. *B* is the plain, undeveloped portion.

These in turn were laid upon a block of pure paraffine wax, and then connected with a battery of six standard gravity zinc and copper battery cells, a Bergmann Wheatstone Bridge and a Thompson Reflecting Galvanometer (the most delicate that is made), and carefully tested as to the amount of current they (the plates) would conduct. After spending nearly two hours in conducting these experiments the conclusion reached was that there is no conductivity in the gelatine film containing the salts of silver. The only measurement we did obtain amounted to over a million ohms resistance, which is equivalent to infinity. There was no difference either in a developed or plain film.

From an 8 x 10 gelatino-bromide plate of medium rapidity we cut off four strips, 1 inch wide and 8 inches long. These we respectively laid on a paraffine block and experimented with an induction coil run by five cells of a medium sized bichromate plunging battery. We wrapped the tin foil about an eighth of an inch in width around the end of each strip, and connected them with the fine wires from the secondary poles of the coil. The by-pass points of the coil were separated about 2 inches, to force the current to pass over the wires and across the section of the strip. The wires were covered with a piece of silk cloth to prevent any light that might come from them from striking the plate. A very weak induced current was generated and kept up for two minutes. The strip marked *C* was thus treated. Next a strip marked *D*, subjected to the same current for the same time, was moistened with water. In each case no current in the darkness of the room was observable to the eye, but when looking closely at the strip the nose detected the peculiar odor of ozone.

A third strip, marked *D*, was then held in the air at right angles to the

passage of the spark passing across between the two by-pass points of the induction coil, these being about $1\frac{1}{4}$ inches apart. Numerous discharges were allowed to play against it for about a minute, and seemed enough to fog it badly.

Lastly, a fourth strip, marked *F*, was laid on the paraffined cake, the by-pass points drawn apart and the full force of the induced current put on. A bluish light glowed all around it; the current was observed to leap across in the air about half an inch above the strip, showing beyond a doubt that the film had no attraction for it.

The distance between the terminal wires connected to the strip was decreased one-half; still the current would prefer the air to the plate.

I placed all the four strips (*C*, *D*, *E*, *F*) in one tray, and poured over them a pyro and potash developer, containing 2 grains of pyro and 4 grains of carbonate of potash to the ounce. In about a minute and a half the films of all commenced to turn, and after three minutes' development they were all pretty well blackened.

C and *D* show no markings other than a general turning of the film. *E* shows the distinct tracing of the sparks as they flew over the film, the points of contact and departure being very foggy. *F* shows the effect of the light very plainly at the terminals where it was surrounded by the wires.

In the cases where there was no electric spark visible and where the plate was in total darkness I cannot account for the turning of the film in the developer unless it was caused by some subtle influence of the current not fully explainable, or to chemical fog. I at first attributed it to the atmosphere of ozone which must have been over the film, but to prove it I had Mr. Hopkins generate ozone by running a series of electric sparks between needle points inclosed in a paper cylinder. Rubber tubes passed from each end of the cylinder. At the end of one tube was placed a sensitive plate protected with a metal shield having a star cut in it. After the electric current had generated sufficient ozone in the paper tube, air was blown in one end, which forced the ozone out against the sensitive plate marked *G* at the end of the other tube. This was kept up for one minute, during which time the ozone was continuously generated. The experiment was carried on in total darkness. After immersion in a pyro and potash developer for ten minutes the entire film simply darkened slightly, but no impression of a star was brought out. The mat marks on the edges of the plate developed out very distinctly, as they usually do. From this experiment I am able to conclude that ozone has no effect on a dry plate. Three other plates, marked respectively *H*, *I*, *J*, were next subjected to the induced electric spark by placing them on a cake of paraffine and resting the terminals of copper wire parallel with the edges. Curious discharges of the spark across the plates were easily developed out, showing that a very faint electric light is sufficient to produce an impression. The sensitive plate thus affords a convenient means of recording the varying forms and shapes of electrical discharges.

In order to confirm my conclusion as to the effect of ozone, I supplied Mr. Hopkins with two other plates of one maker, Cramer 40, 4 x 5, and had him expose one in absolute darkness for five minutes to the ozone, and the other for two minutes. These I placed in a hydroquinone developer (10 grains hydroquinone, 15 grains carbonate of potash to the ounce), and kept them there for

half an hour, covering the dish during development. Nothing appeared except a slight darkening of the film all over; not a sign of the star I had hoped to obtain was visible. Plates marked *K* and *L* were thus treated.

Taking into consideration the excellent electrical conducting qualities of metallic silver, it is rather surprising to note that its salts, when inclosed in a gelatine film, appear to be such a good electrical insulator.

If electricity is ever to be employed in transmitting photographs by telegraph, it will have to be done by some method of controlling the variations of light and not by any direct action of the current. Mr. Paddock and myself are about to experiment in this direction. The field is an interesting one and there is room for several useful experiments. What I have said is the latest in this line and I trust my work may stimulate others to experiment further.

OUR ILLUSTRATION.

THE frontispiece of this issue of the BULLETIN is an excellent portrait of Mrs. Harrison, the first lady of the land, at the White House, Washington. The original picture was made by Mr. W. H. Potter, of Indianapolis, who also made the portrait of President Harrison which appeared in a recent issue of our journal. It is needless to say that they are examples of the best phases of photographic portraiture in America, and fine specimens of photogravure.

OBITUARY NOTES.

As we go to press we learn the sad news of the death of DAVID COOPER, who was so well known to every photographer in America. In our next issue we shall give particulars of his life and work. He died at Kingston, Jamaica, West Indies, on April 6th last, where he has been residing since last October in search of the health he never recovered.

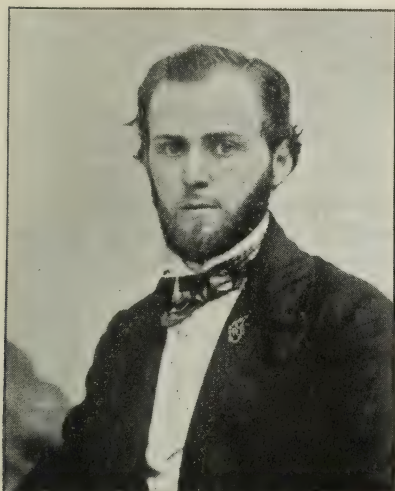
WE also regret to note the death of Mrs. ABRAHAM BOGARDUS, the wife of the well-known veteran photographer of New York. We extend to our good friend the sincerest sympathy in his bereavement.

OUR PUBLISHERS' OLDEST CUSTOMER.

ABOUT the end of April in the year 1859, there appeared in the counting room of the old store of Messrs. E. & H. T. Anthony, at No. 308 Broadway, a slim, pale faced young man, who said he had been originally a reporter on the *Troy Daily Times*, but for the past three years had been in photography. He said he had a capital of \$250, with which he proposed to start, in a moderate way, a gallery at 839 Broadway, corner 13th street. That one could succeed so far up-town was problematical; but the young man, then twenty-seven years of age, felt sanguine that industry would prevail. Mr. Edward Anthony gave him a warm greeting, much encouragement, and such credit as he would accept, and George G. Rockwood began business.

Thirty years have passed since then, bringing many changes. Of those whom Mr. Rockwood greeted on that day, not one is now in the firm and only two among its employees. Death has removed the two senior partners, while others have come into the establishment since that date. It is probably true that

Mr. Rockwood, although not the oldest man by mere years, is the oldest living customer on its books. For thirty years the connection has been unbroken, and his monthly account has run with never a serious friction during that extended term, the amount of the transactions reaching about one hundred and eighty thousand dollars. Mr. Rockwood tells us that he feels as much interest and enthusiasm in his art as on the first day that he went to business, and works with as little fatigue. He poses every sitter, gives close personal attention to all the details of his establishment, and is as prolific of new things as ever. Blessed with a strong physique and hopeful temperament, he hopes to round out many more years of association with his friends, the house of E. & H. T. Anthony & Co. The two process plates of Mr. Rockwood represent him "Then and Now!"



Now in the prime of manhood, we have always found Mr. Rockwood a genial gentleman with untiring energy, truly honorable, and an excellent example of one who

" Never falters nor abates,
But labors and endures, and waits
Till all that it foresees, it finds,
Or, what it cannot find, creates."

WHAT a mockery of a name is this: The County Court of Culpeper has just refused to grant a license to sell liquor at Brandy Station.—*Richmond State*.

THE office that is seeking the man can't find him, owing to the scrambling crowd of office seekers.—*St. Paul Pioneer Press*.

IF a man can only make his story improbable enough he can always find somebody to believe it.—*Somerville Journal*.

AFFECTION goes into bankruptcy when it marries for money and fails to get it.—*New Orleans Picayune*.

POET—What do you think of my verses? Critic—Too many feet and too little head.—*Texas Siftings*.

Members present—Bain, Charroppin, C. M. Alexander.

Upon motion of Mr. C. H. Holland, the report of the Executive Committee was adopted as a whole.

President BAIN—I would request Mr. Collins to draw up the necessary papers for the incorporation of the Club.

Mr. SHERRARD—I understand that there are some magazines and periodicals missing from the Club library. If the Librarian will give me the names and numbers of any books that may be missing I think I can furnish them for the Club.

Applications for active membership from Mr. Charles S. Moffitt and Mr. Charles B. Compton were read and referred.

President BAIN—There were two applications to act upon at this meeting, but as the Chairman of the Membership Committee is absent, we will defer action until the first meeting of next month. The next thing in order will be the election of officers for the ensuing year.

Upon motion of Mr. Withnell, Mr. C. M. Alexander was appointed temporary Chairman.

After balloting, etc., it was found that the following members were elected: President, Robert E. M. Bain; Vice-President, Rev. C. M. Charroppin, S. J.; Secretary and Treasurer, W. M. Butler; Executive Committee, J. W. Dunn, E. C. Jewett, J. B. Holman.

Upon being introduced by Mr. Erker, Mr. Drescher exhibited and explained a shutter for time and instantaneous work, and also a lens, made by the Bausch & Lomb Optical Company, of Rochester, N. Y.

Upon motion the meeting adjourned at 9.30 P.M., to meet Tuesday, April 16, 1889, at 8 P.M.
W. M. BUTLER, *Secretary*.

LYNN CAMERA CLUB.

At a meeting, held on Tuesday evening, April 2d, the Club gave a lantern slide exhibition. Some excellent slides were shown, among which were slides from Messrs. Darcy, Jeffers, Bacheller and Coates, of the Lynn Club, and also some very fine ones from Messrs. Francis Blake, E. F. Wilder, William G. Reed and E. Milliken, of Boston. About two hundred slides were shown, and a large proportion of the work was of the highest order. The meeting was the most successful of any the Club has ever held. After the regular exhibition a few slides were put through, to select those suitable for the set to

be used in "A Glimpse of Ye Old Shoe Town," that is in preparation by the Club. Six of the slides shown were accepted, as follows: "Old Newhall House," "Old Assembly Building," "Boston Street," "Old Sargent House," "John T. Moulton House," "Trevett Rhodes House and the Old Academy Building on Western Avenue." The negatives were made by Mr. Darcy and the slides by Mr. Bacheller. Mr. Drew tried a few slides, made on plates coated by himself, that showed a fine, crisp picture. The increased interest in lantern slides is very encouraging, and the Club will soon be well "under way" in this direction. The next exhibition to be given by the Club will be "Illustrated Boston," prepared by the Boston Camera Club.

At a meeting of the Lynn Camera Club, held Tuesday, April 16th, it was decided to show the set of slides, "Illustrated Boston," at the hall of the Y. M. C. A., April 26th. These slides were made by members of the Boston Camera Club, and have already been exhibited in New York and Boston, attracting considerable attention and merited praise. They were kindly loaned to the Lynn Club for this exhibition.

This is the first public exhibition of the Lynn Camera Club. The next will probably be "Illustrated Lynn and Vicinity," the work upon the slides for which is at present progressing.

J. W. GIBBONEY,
Secretary.

BALTIMORE AMATEUR PHOTOGRAPHIC SOCIETY.

THE regular monthly meeting of the Amateur Photographic Society of Baltimore was held at the rooms on March 15th, with a pretty full attendance, over thirty members present, and the President, Isaac T. Morris, in the chair. Roll call was dispensed with, as there was to be a slide exhibition, and as little routine business as was possible was the order of the meeting. The committee or jury of award on the prizes made their report, and highly complimented the members contesting for the very efficient work in composition and variety of subjects, as well as the method of handling the negatives in development. To the ladies interested in the prizes did the Committee pay especial praise, and certainly did they deserve it, as, taken all in all, they were certainly fine prints and most excellent negatives, the variety of subjects well chosen, and the composition as perfect as though some

Old master of painting had selected the view to immortalize his name on canvas. The awards of prizes were handsome medals in the shape of watch charms, with the initials of the Society engraved thereon, as also in one instance a detective camera for the winner of shutter work, a lantern for the winner of slides, a camera, with tripod, for the winner of time prize, and for the winner of the prize for the best general work a medal somewhat similar to that of the time work medal.

These medals were of pure gold, and about the size of a silver half dollar, and excited the praise of every one for their artistic beauty, and the winners were more than pleased with their good luck. The jury decided as follows: For the best twelve prints of time work, Harry D. Williar; for the best twelve prints instantaneous work, John H. Trimble; for the best six lantern slides, Daniel Miller; for the best twelve miscellaneous prints, Miss Fannie Robbins. The jury of award were discharged with the thanks of the Society.

Urgent request was made to the members to hand in negatives, so that the House Committee might make slides for the coming May public lantern slide exhibition, which at present promises to be the best that the Society has had yet, as the class of negatives in the hands of the Committee up to this time are better by far than in the past, and as also do the slides made up to the present time surpass those of any previous year, and we are promising ourselves and the public as well that we will have a first-class exhibition this year.

The committee to name officers to be elected for the coming year was appointed, with instructions to report at the next meeting on the 19th of April. Mr. A. S. Murray exhibited his "Clark Detective," as also thirty-nine prints of negatives made at Washington during the inauguration, and fully explained the working of the camera. His exposure was the result of two days' work and developed with hydroquinone. There were only a few not first-class; but he wished to demonstrate what the detective would do, so he showed the full result of two days' work, viz., thirty-nine prints.

Mr. Daniel Miller, with his lantern, threw upon the screen the competing slides, as also a lot of fine ones that were made by different members, but not in competition, and after the exhibition was over, the hour being late, the meeting adjourned till Friday, April 19th.

HARRY C. WILLIAR,
Secretary.

CASE SCHOOL CAMERA CLUB (CLEVELAND).

At the regular meeting, held Friday afternoon, April 19th, Mr. Fred. A. Coleman gave a very interesting demonstration of the making of transferotype prints and their transfer to opal glass.

He also exhibited some fine bromide prints of landscapes which showed good judgment in choice of position.

MILTON B. PUNNETT,
Corresponding Secretary.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, MARCH 12, 1889.

THE meeting was called to order shortly after eight o'clock, *President* CANFIELD in the chair.

The President—The first thing of importance to-night is the paper on "The Effect of Electricity on Dry Plates," by Mr. F. C. Beach, which I will ask him to read.

MR. BEACH—I have been making a few experiments in regard to the action of electricity on dry plates. While it is rather scientific perhaps it may be of some interest to you.

Mr. Beach then read his paper. (See page 246.)

After reading the paper Mr. Beach passed around the specimen plates showing the different results he had spoken of.

Mr. Charles Simpson then showed a novel arrangement for changing plates, especially designed for those carrying a detective camera. As it is often the case while on a day's excursion that the amateur exhausts the supply of plates in the holders, of which he as a rule does not carry over half a dozen, Mr. Simpson's arrangement for plate changing may prove of interest to amateurs using a detective camera, and will therefore be briefly described:

It consists of an ordinary hand-satchel 5 x 10, which holds a couple of boxes of unexposed 4 x 5 plates, an empty box to receive the exposed plates, and a bag made of two thicknesses of black satine. This bag is perfectly light proof, is about 2½ feet long, 2 feet wide, with sleeves on each side, the same having strong rubber bands for the wrists. At the top a tape is fastened, which goes around the neck so that the bag, when being used, is suspended like an apron. The lower end of the bag has an opening, which is partly closed by an elastic band, but through which the satchel can be passed into the bag when plates

are to be changed. The opening is then closed by a couple of buttons, the hands inserted through the sleeves, the satchel opened, and is held open to its fullest extent by placing a short rod or stick across the opening at one end.

The object of having the satchel inside of the bag is, that in a sitting position, which is preferable, and placing the satchel between the knees, the bag is spread out like a tent, by which abundant working room is obtained; besides, by having the satchel inside the bag, its contents are more easily handled.

Mr. Simpson, after explaining as above, demonstrated the practical use of his contrivance by changing plates before the audience; and it required but a few moments to adjust the bag, change plates and put everything back in the satchel, proving the fact that the amateur, by carrying a small satchel over his shoulder, containing the above described articles, can change his plates at any time and place while on his journey.

Mr. BEACH—How long does it take to change a dozen plates?

Mr. SIMPSON—I tried it last night. In eight minutes I rigged the whole thing up and filled three double plate holders. That included getting ready and all.

A *Member*—What is the material?

Mr. SIMPSON—It is called satine. I have a few samples. If you take it and double it, and hold it up to the light, you can't see a particle of light through it. Take it single and you can see just a trifle of light.

A *Member*—Are you not liable to expose the same plates twice? You have got two boxes, one of exposed plates and the other of unexposed plates.

Mr. SIMPSON—If I put the satchel into the bag I naturally put a box on top in which I am to put my exposed plates. Then I take that box out and lay it alongside while I feel in. I only have one box inside at the time I am changing.

A *Member*—Suppose they shift their positions in carrying the satchel?

Mr. SIMPSON—I look at my box before commencing operations.

The *President*—You examine those by daylight before you commence operations?

Mr. SIMPSON—Certainly; I sit down and have everything in readiness and put them in my bag. I will pass it around.

The *President*—I have here a letter from Mr. M. Carey Lea, accepting his election as a member of this Society. (The President then read the letter.)

New members elected since last meeting of Society are: Messrs. D. K. Young, William T. Clerk, William Schlemmer and Linzee Prescott, Active Members; Doctor I. F. Wardwell, Corresponding Member.

As Honorary Members, Dr. J. M. Eder, Leon Vidal, A. Davanne, Dr. H. W. Vogel, J. Glaisher and M. Carey Lea.

The President stated that certain proposed amendments to the Constitution and By-Laws had been discussed and agreed upon by the Board.

Mr. DAVID WILLIAMS was then introduced by the President, and exhibited some novelties. Among them was a flash lamp, which distributes the magnesium in a fine circular jet in the middle of a strong annular flame of alcohol, the object being to produce a perfect combustion of the magnesium, thus securing a brilliant and nearly instantaneous flash. He exhibited a sample of the film holder, of which he had given a description at a previous meeting. This holder is made by Mr. Barnett, and is extremely simple and easy to use. Mr. Williams illustrated this by inserting a more than usually twisted film while standing before the meeting, without using a table or support of any kind. He described a new arrangement for a finder, which stands immediately over the center of the lens of the camera, and is movable vertically by a small rack and pinion motion. This enables the picture on the ground glass of the finder to cover exactly the same field as the ground glass of the camera. Mr. Williams believes that the slight additional care involved in adjustment is more than compensated by the result. He also showed a tripod, which is capable, by the addition of telescopic joints, of being extended to any height up to $7\frac{1}{2}$ feet. Also a peculiar double flap shutter; a very nice traveling box divided into compartments for holding chemicals and holders; a compact folding $6\frac{1}{2} \times 8\frac{1}{2}$ camera, and a few other things. He had separate lens boards made for each lens, so that it was only necessary to remove the lens, board and all, from the camera, and substitute another very quickly, without unscrewing the lens from its flange.

The *President*—I understand that Mr. Milburn has one or two novelties which he will kindly exhibit.

Mr. MILBURN—The first thing I have to show you is a new shutter. In order that you may see this properly I will pass it around. With this shutter you can make a time exposure or an instantaneous exposure in

the one-hundredth part of a second. Here is a valve which you can turn so you can fix the time that it is needed. That is, you can set it for a second's exposure or the tenth part of a second or the one-hundredth part of a second. To make an instantaneous exposure you turn this lever down and set it in that way. It is now set for a one-hundredth part of a second. It is now set for the tenth part of a second. Now for half a second. This is for a full second.

The *President*—How recent is this?

Mr. MILBURN—I really don't know. I think it is within a couple of months.

The *President*—We had one shown here at least three or four months ago.

Mr. MILBURN—Did it have the time lever?

The *President*—I think not.

Mr. MILBURN—You see, the advantage of this is, you can set it for different parts of a second or one second, and you can make time exposures too. The shutter also itself acts as a diaphragm. The cost of this size fitted to this same lens is \$11.50; of course when it is fitted to other lenses it comes a little higher. I think the extreme cost fitted to any lens is about \$16.

A *Member*—Do you know what diaphragm you have when you set it?

Mr. MILBURN—Yes; there are marks here, regular scales, which tell the size of the diaphragm. It is a Bausch & Lomb shutter, and the recent improvement is the air valve attachment for regulating the duration of exposure.

Now, I have a camera here which has two particular features in it, cheapness and good workmanship. A 5x7 is sold for \$17. I think it is a very good camera. It has a little catch here which is new.

The *President*—Does it reverse?

Mr. MILBURN—We have an outside reversing arrangement. This is the way the plate holder slides in, and after it is in there it locks

in. The roll holder would slide in the same manner. For reversing you have this little arrangement here screwed on the side. That is so as to get the weight of the camera in the centre to balance it.

Mr. WILLIAMS—How much do the plate holders cost?

Mr. MILBURN—5x7 cost \$1.50.

Mr. WILLIAMS—For a double holder?

Mr. MILBURN—Yes, sir.

The *President*—There is a paper to be read by the chairman of the committee, Mr. Stebbins, on "Meta-Bisulphite of Potash."

(Mr. Stebbins then read his report on the "Sulphites of Potash.")

The *President*—The next item of interest on the programme is the demonstration of enlarging on bromide paper by artificial light. Mr. Milburn will explain it to us.

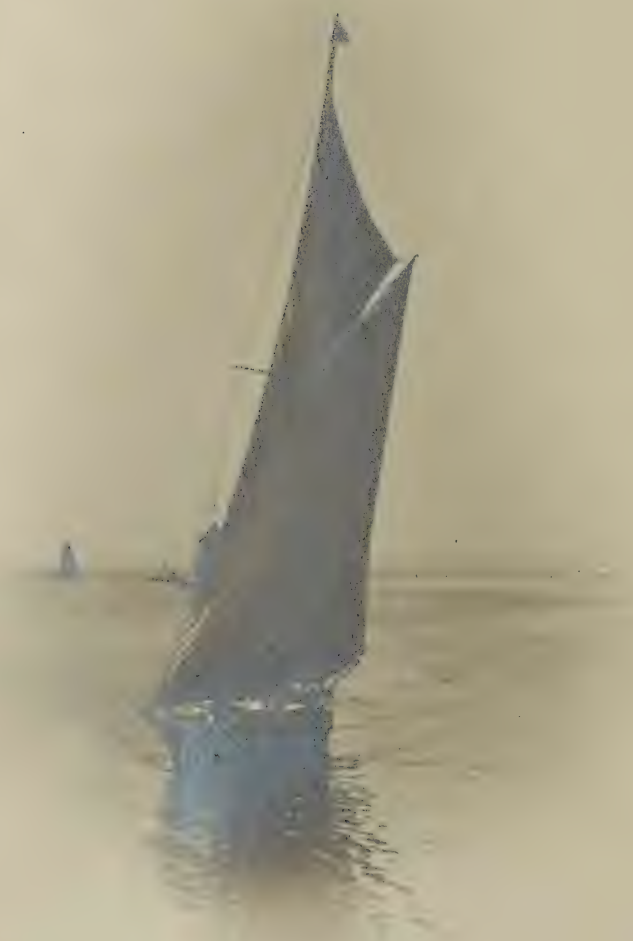
Mr. Milburn then read a paper on "Enlarging on Permanent Bromide Paper" (see next BULLETIN), after which a very successful demonstration was made. The lights were now extinguished. In the optical oxyhydrogen lantern of the Society was placed a 5x8 portrait negative, while on the screen was affixed the sensitive paper four feet away. The head of the portrait was 2½ inches in diameter and was enlarged up to life size. A Voightlander euroscope lens was employed. With a vignetting card held in the hand between the lantern and the screen, Mr. Milburn made an exposure of about twenty seconds. Then he gave a second exposure of ten seconds, screening the light from all except the very dense portions of the negative. On developing he obtained a very evenly lighted and harmonious enlargement. The picture was a very pretty child's head. After the demonstration a hearty vote of thanks was accorded to Mr. Milburn for his kindness in conducting the demonstration.

The meeting then adjourned.

OWING to the pressure of preparations for the Centennial Celebration in New York, the answers to "What our Friends Would Like to Know" must be left till the next issue of the BULLETIN.

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"THE SENECA."

CONTACT PRINT

ON ANTHONY'S RELIABLE BROMIDE PAPER

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ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

MAY 11, 1889.

Vol. XX.—No. 9.

THE CENTENNIAL IN NEW YORK.

IF every professional photographer had ordered the weather to be arranged for him, if every amateur had interviewed "Old Probability" in order to get the most favorable meteorological circumstances, a more perfect condition of sunlight and atmospheric circumstances could hardly have been conceived, than fell to the lot of photographers during the three days of celebration in New York City.

Monday morning dawned a little uncertain, but before 10 o'clock the mists rose, and a most perfect day, photographically, bathed New York Bay in sunshine with an atmosphere clean and crisp from the recent rains.

The ceremonies of Monday included the voyage of the President from Elizabethport to Wall Street, New York, and the reception afterwards.

The naval parade up the North River, in the afternoon, was also a part of the programme, but the interest being divided after the landing of the President, this part of Monday's pageant was not as interesting as the earlier ceremonies.

New York Bay, with the cities of New York and Brooklyn and Jersey City, gives always a beautiful picture on a bright Spring day; but we are satisfied that many generations will come and go before there will be another such a picture as was seen between Staten Island and the Battery on April 29, 1889. This immense sheet of water was literally packed with craft of every kind, from the isolated individual in his Rob Roy canoe, to the great three-decker, packed with its thousands.

On every side we saw the photographer and his camera. Some on tugs with large cameras and lenses to correspond, others here and there in the mass of humanity on the large steamers with detectives and hand cameras, getting shots at every conceivable object.

One of the most pleasant expeditions on this eventful occasion was that arranged for by the Society of Amateur Photographers of New York. They chartered an excellent propeller, the Philadelphia, and a more delighted crowd of amateur photographers never sailed together. Cameras of every style and make, from the little 4 x 5 outfit and the detective, to the more elaborately finished and large 8 x 10, were to be seen upon the boat. From the time of starting, 9.30 A.M., to the finish, the rattle of the reversing of holders and the click of

the shutter was to be heard on every side. We have no doubt many dozens of plates were spoiled, but we are equally satisfied that many dozens of good negatives were captured on that beautiful day.

Of the objects to be photographed there was an unlimited number. The new iron-clads, the Chicago, Brooklyn and Boston, the good old Kearsarge, and others, gave excellent pictures for many cameras. When the President passed in the United States Steamship Dispatch and the yards were manned, a scene was presented that will never be forgotten by those who witnessed it, and thousands of cameras caught the beauty of it. The salutes fired by the iron-clads also gave some excellent pictures for the photographic plate, and we have already seen some good negatives of this particular phase of Monday's ceremonies.

On Tuesday the military parade was another excellent opportunity to obtain fine instantaneous pictures. The day was perfect and the parade unusually interesting from the variety of uniforms worn by the various State regiments, especially those from the South.

Of the land parades, that of Wednesday will leave the most beautiful memories to those who saw it. We did not believe until that day that New York City contained so many men who were interested in such a wonderful exhibition of artistic work as was seen in the various tableaux. And we must give the palm to our German friends for their patience, skill and good taste, as displayed in the elaborate pictures presented by the Arion and Liederkranz societies. We sincerely hope that some perfect photographs of these wonderful scenes were obtained on May the first.

When we think of the various events, the naval review, the military and the civic parades, when we recall the beautiful triumphal arches under which the processions passed, and we remember the marvelous display of bunting, flags and banners, we cannot but regret that photography is incompetent in one very important feature in recording such events—the inability to catch the colors which gave the chief charm to the decorations, caught as they were in the gleams of sunshine, wafted on the breeze, and filling the hearts of spectators with patriotic zeal. Those who saw the parades will remember them chiefly from the wonderful display of color to be seen on every hand, but the photographic plate will give but monochrome. Furthermore, the ordinary plate is positively incorrect in its record of just those colors that gave such brilliant effects to the scenes of the Centennial. Let us hope that before another century the genius will arise that shall give us the means of photographing in colors.

EDITORIAL NOTES.

THE semi-centennial jubilee exhibition will be held in Berlin during September and October next, and our esteemed correspondent, Dr. H. W. Vogel, is very anxious that the United States shall be well represented. All exhibits should reach Berlin by August 11th next, and our publishers have kindly consented to take care of the shipment of any pictures that may be sent to the exhibition through them. Those intending to exhibit should notify us as early as possible, that we may have an idea of the size of the exhibit. We hope that the United States will be well and largely represented.

THE "International Annual" for 1889 is in the press, and is equal, if not superior to, its predecessor. The editors have been hard at work arranging a

large number of contributions from the most prominent photographic writers in the world. A number of new tables have been specially made for the volume, which are expected to be useful to the working photographer, both professional and amateur.

IT is estimated that between thirty-five hundred and four thousand pictures of the Naval Parade were taken on Monday, April 29th; and the majority of these were captured by one hundred and fifty cameras on board the boat Philadelphia with the Society of Amateur Photographers.

AT a recent meeting of the New York Camera Club, Mr. Alexander Black, of the *Brooklyn Times*, gave an excellent exhibition of lantern slides, illustrating "Life Through a Detective Camera." The pictures were amusing as well as instructive. Mr. Black's collection is unique and well worth seeing.

WE have received from Professor E. C. Pickering an excellent film positive of the late total solar eclipse as seen in California. We tender our best thanks to the Professor for his kind remembrance, which is as interesting as it is well done.

FROM Dr. P. F. Fulmer, of the High Falls Hotel, Dingman's Ferry, Penn., we receive the following announcement, which will be of interest to our tourist readers: "Many amateur photographers make this their summer home, and are most enthusiastic in their praise of the many picturesque and charming scenes. A dark room and all desirable advantages are given for photographers."

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Lightning Photography for Practical Portrait Work—Kurtz's Reproductions from Oil Paintings—New Developers—New Lenses—Chloride of Silver Developing Paper—The First Orthochromatic Photography—Color Sensitive Photographs in Germany.

WHAT is the latest news in photography? Answer. Daylight is set aside. Flash pictures are ruling. Now, it is an old proverb that says: "Nothing is eaten so hot as it is cooked." Still, the matter deserves attention, coming from one of the most distinguished photographers, Herr Van Delden, in Breslau. He presented the "Verein zur Förderung der Photographie" here with a number of magnesium flash pictures. They were taken during a masquerade ball with the Schirm magnesium flash apparatus, and were of such a perfect execution that they called forth the greatest astonishment of all present.

Messrs. Selle Lindner and Haberlandt praise the pictures, representing single full figures, and even groups of six persons, highly, and particularly the harmonic lighting is generally and greatly admired.

They illustrate most completely the capability and accomplishments of the magnesium flash-light and called forth a lively discussion about its practical and profitable application in Berlin at fancy dress balls, etc., in private circles as well as in public halls, and to which the writer called attention several months ago. My opinion, after Delden's success, met with even greater approval than at that time.

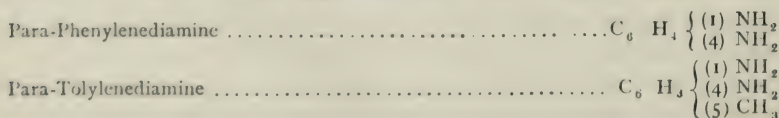
The Schirm magnesium flash apparatus is described in the *Photographische Mittheilungen*, July number, 1888. It consists of lamps with alcohol, of which one is placed on the light side, the other on the shadow side of the subject. For groups a third lamp is required. All three are connected by thin tubing, through which by means of pneumatic pressure the magnesium powder is blown simultaneously into the flame. The effect is instantaneous. The matter is not only of significance for pictures to be taken at night, but also for ordinary portrait work. Herr Van Delden says that he is building a new studio now, and exclusively for magnesium flash pictures. Daylight, being too uncertain in this country, does not come into consideration. The place has only one window, is not away up-stairs, but on the first floor, where at any time of the day and in any state of weather photographs can be taken, and at that, "instantaneously." You will say this has been accomplished a long while ago with electric light. But the expense of such an electric arrangement is about \$2,500, whereas with a magnesium lamp it is only \$25, and instantaneous pictures have never been made with electric light. Herr Van Delden's example has proved so successful that here in Berlin such a flash-light studio is also in course of construction.

The same night that Herr Van Delden presented his flash-light pictures, quite a number of reproductions of larger size, made by Kurtz in New York, met with general acknowledgment. The pictures were made on azalin plates, through yellow glass, and particularly some of them, giving an excellent reproduction of all the color gradations, were greatly admired. Most conspicuously in comparison with similar reproductions in the market is Makart's "Hunt of Diana," in which the trees seem to be completely worked out, even to their greatest depth. The difficulties incident to a photographic view after a forest scenery by Corot, held in the deepest color, were surmounted in a similar way. The reproductions of some pictures, by Tadema (Reading Homer), the Judgment of Paris, by Rubens, and some desert scenery, by Remington, were just as successful.

Lately I wrote to you about a developer. Different new ones have appeared in the mean time, about which the opinions are still divided. Since the chemists are occupying themselves more generally with photography, they investigate every new organic substance as to its developing capacity, and indeed, many good things are brought to light that way, but the principal thing is always the correct formula. Hydroquinone was tried in vain for years before the correct formula was discovered. At present it is the ruling developer, placing all others in the shade.

The very latest is now the application of the para-phenylenediamine, the para-tolylenediamine, and the xylylenediamine, for the development of photographic pictures, by Dr. M. Andresen, in Berlin. Patented in the German Empire August 1, 1888.

This invention concerns the application of—



and



in diluted aqueous, weakly alkaline solutions for the development of photographic pictures in films containing silver haloid.

According to the declarations of the inventor, this developer acts more powerfully than all hitherto known developing solutions. The negatives obtained by the same, if correctly exposed, are said to be of great clearness and eminent gradations of tone, not only in the high lights, but particularly in the middle tones and shadows; further, in consequence of the peculiar dense structure of the silver deposit they have excellent printing qualifications.

The ready mixed alkaline developer shows only a slight discoloration after several weeks' exposure to the air.

In the field of instantaneous cameras there are just as many novelties as in that of the developer. Every day a new camera will appear under some strange sounding name, and it is almost impossible to examine and try all the different constructions. The camera of to-day is perhaps old after four weeks. The latest camera, "Probata," excels by the excellent objective anastigmat, which has been calculated by the efficient astronomer, Miethe, one of the inventors of the flash-light (Gädicke and Miethe).

This camera has already been described in the *Photographische Mittheilungen*, XXIV, page 173, but only lately it is manufactured in large quantities by Mr. Hartnack, of Potsdam. I reported to you about it in the November number of 1888. The best about the anastigmat is, that one lens actually represents two, shortening or extending the focus by sliding the lenses closer together or wider apart. It can be used as a light-strong aplanat if the lenses are moved apart, and will then show 95 mm. focal distance and 150 mm. diameter picture surface; further, as a wide-angle, if the lenses are screwed together as much as possible, it has then a picture surface diameter of 170 mm. The second, or anastigmat, wide angle—landscape objective No. 1—has 116 mm. focal distance, covers with full opening a 9 x 12 cm. plate, and has, with a small stop, a picture surface diameter of 230 mm. The last mentioned objective is recommended very much for the Camera "Probata," furnishing very good fully exposed instantaneous pictures, and costing only 40 marks.

Color sensitive (so-called isochromatic or orthochromatic plates) come more and more into general use here. Gädicke mentioned, in the last meeting of our Society, that he has sold only colored plates during the last half year. They have the same sensitiveness as the ordinary plates, the same keeping qualities, and are developed in the same style. There is only this difference in the result, that the color sensitive plates give far better negatives for portrait work, and do not require half as much retouching in the yellow and spotty places as the ordinary ones.

Chloride of silver gelatine paper is more and more applied for the production of quick copies.

Recently I made some views with magnesium light in a private Society. I cleaned the same by placing them in a concentrated solution of chloride of sodium, washing in water for fifteen minutes, drying in alcohol, and copied them upon chloride of silver developing paper, with 12 cm. magnesium, at a distance of 25 cm., and thus I was in the position to present a proof to the audience in thirty-five minutes.

In the *Photographic News* of April 19th I read a notice of Mr. Ives about his orthochromic chlorophyl process. He says that his claims were unqualifiedly

endorsed by the Franklin Institute, "which awarded me the John Scott legacy medal for the discovery and publication of the first practical working process of photographing colors in their relative degree of light and shade, as they impress the eye."

I have the highest respect for the works of the Franklin Institute, but I cannot conceal the fact that corporations can err as easily as a single man.

The senate of a German university, for instance, gave a very honorable title to a gentleman for an invention, not made by him, but by somebody else. This happens very often here and it can also take place in the United States. I claim that I have taken the first isochromatic or orthochromatic photograph (a blue ribbon fastened on a yellow one) in the year 1873, five years before Mr. Ives, and that I have published the *modus operandi* (*Photographische Mittheilungen*, December, 1873, p. 237). Objection has been made, that I had taken only ribbons, and not a picture. That makes no difference at all.

Daguerre remains the inventor of the daguerreotype, even if his first plate would be no more than the reproduction of a blackboard with white characters on it.

BERLIN, April, 1889,

[By our Special Correspondent.]

ENGLISH NOTES.

MARCH is, for the photographer, as well as for nature, a month of preparation. Hence it is well that at this period of the year should be held the annual "Conference," initiated by the London Camera Club, and the Crystal Palace Photographic Exhibition. At the one the worker will get good advice, and at the other he will be able to select from an immense variety of apparatus.

The Camera Club Conference was again held at the Society of Arts, John street, Adelphi, the days of meeting being Tuesday and Wednesday, March 26th and 27th. A "smoking concert," held on the Monday evening in the club rooms, served to "bring people together," and to allow of the inspection of a fine collection of pictures which had been hung on the walls.

Captain Abney, C.B., F.R.S., took the chair each day at the Conference, and about one hundred friends were present. The discussions were short, as the papers were numerous and lengthy, and had to be "got through." They were, however, of high quality.

The work done was as follows:

Tuesday, March 26, 1889; time, 2 to 6 P. M.—Mr. Conrad Beck, "Depth of Focus;" Mr. J. Brett, A.R.A., "The Relation of Photography to the Pictorial Art;" Mr. P. H. Emerson, B.A., M.B., "Science and Art;" Mr. Lyonel Clark, "A Comparison of Developers;" Captain W. de W. Abney, C.B., R.E., F.R.S., "The Law of Error and Photography;" Mr. T. R. Dallmeyer, "Shutters;" Mr. G. Lindsay Johnson, M.A., M.B., "A Shutter Speed Measurer."

In the evening there was an exhibition of lantern slides, small electric arc-light being employed. But no electric light for my slides, if you please! It makes the best slides look threadbare and thin. The slides shown included those sent by the American societies to the Camera Club, and also Nottman's collodion slides of scenery on the Canadian Pacific Railway, etc.

Wednesday, March 27th, 2 to 6 P. M.—Mr. C. H. Bothamley, "Chemical Changes from the Modern Point of View;" Messrs. A. A. Common, F.R.S.,

and A. Taylor, "Irradiation in Astronomical Photography;" Mr. A. Dawson, "The Field of Photo-gravure;" Mr. W. T. Wilkinson, "Dry Plates for Photo-Litho and for Collotype;" Mr. A. Pringle, "Photo-micrography;" Captain A. M. Mantell, R.E., "Photography Applied to Military Purposes."

7.30 P. M.—Annual club dinner for members and friends at the Holborn Restaurant.

The dinner was a popular feature, and when Mr. Jerome Harrison proposed the toast of "The Camera Club," and coupled with it the names of Captain Abney (President) and Mr. George Davison (Honorary Secretary), the applause was long and hearty.

As to the general work done during the meeting, we can only touch on a few of the salient points.

Mr. Brett said that "Art" and photography had little in common. But, then, his idea of Art was that Nature is, on the whole, somewhat of a blunderer, and that it is the province of the artist to "improve" on her doings. Well, it may be so; but let the artist be truthful, at least, and when he shows us his picture of, say, Vesuvius, with the mountain sloping at an angle on which it would be impossible for the lava-flows which compose it to have solidified, let him frankly label it, "Vesuvius, as improved by Jones." As a photographer, I declare that the greatest debt which I owe to photography—next to the fact that it has taught me to look for and to see beauty in Nature—is a desire that every picture should be *truthful*. Ideal landscapes I can admire, but do not call them by the names of places of which they are only "adaptations."

Mr. Lyonel Clark still thinks pyro-ammonia the best of all developers (and I agree with him). Mr. Dallmeyer said the diaphragm slit (with a rectilinear lens) was the best place for the shutter. He had tested a new shutter invented by Mr. Lyon, and found that it had the great advantage of remaining fully open during a great proportion of the total time of exposure. Dr. Johnson's "speed measurer" was a clock whose hands made one complete revolution (or more, as required) each second.

THE CRYSTAL PALACE PHOTOGRAPHIC FAIR.

Take a gigantic green-house half a mile long and two or three hundred feet in height; spread fountains, flowers and statuary liberally over the interior; and then persuade all the dealers in photographic apparatus to arrange their goods on a series of handsomely fitted up stalls running the entire length of the great nave (nearly a quarter of a mile), and you will have some idea of the Photographic Exhibition at the Crystal Palace, which has now, thanks to the energies of Messrs. S. G. B. Wollaston and J. F. Peasgood (the Executive Committee), become an annual affair.

The exhibition opened on March 19th, and will remain open for one month. As the Palace is only a pleasant half hour's railway ride from London, it is a popular place of resort (though not so popular as it ought to be), and the attendance at the exhibition has so far varied from 5,000 to 15,000 per day; although season ticket holders and other attractions will account for many of these. Still, there can be no doubt but that such shows do good to our art in many ways. They popularize it, and they enable one to conveniently compare the various forms of apparatus, to handle them, etc.

The pictures sent include 1,200 frames, besides 1,500 lantern slides. They

are arranged in the various "courts" which branch laterally from the north nave; and are shown on fifty large screens, and in seventeen "alcoves"—the latter term being applied to beautifully draped recesses, each of which is occupied by the work of a single exhibitor. Not many medals have been awarded, but I note that Mr. H. W. Gridley, of New York, has again received an award for his beautiful views of Palmyra.

In the apparatus department the number and variety of hand cameras is really surprising, but I saw nothing that I liked better than Anthony's "Climax" Detective Camera, which was shown by Fallowfield. Anthony's bromide paper was also conspicuous on several stalls, and I hope to try it soon. The present popularity of slow or "tentative" development, which I have always advocated so strongly, has led to the introduction of numerous pendulum rockers to keep the trays in motion. Of new shutters the cry is "still they come." The Lyon Shutter was shown by Fallowfield, and when the manufacture is perfected I think it will take the lead. For those who want a cheap shutter, there is nothing to equal the "roller blind" form which is known as the "Kershaw." The shutter speed measurer or chronograph, invented by Mr. W. J. Wilson, of the Paget Prize Plate Company, is by far the best thing yet done in this line. A metal disc with a radial slit revolves at a given speed in front of a brightly illuminated ground glass dial graduated into six hundred divisions. By means of the shutter to be tested a photograph is taken of the dial when the metal plate is revolving, say, once per second. If the dry plate when developed shows an arc containing (say) ten divisions or graduations, then the speed of the shutter must have been the sixtieth part of a second ($600 \div 60 = 10$). It is surprising how the (so-called) rapid shutters mostly break down when they are rigidly tested. Very few will give an exposure as brief as the fiftieth part of a second. Probably the best (and the most expensive, for it costs \$30 or more) is the "Thury & Amey" shutter, made at Geneva by the firm of that name. It is very easy, however, for a shutter to be too rapid for ordinary work.

There is a very fine exhibit of pictures made on Thomas' "Pall Mall" plates. The landscape plates made by this firm are so "thickly coated" as almost to defy halation; and they give with ease any amount of density. I have lately been trying dry plates the backs of which have been very finely ground (they were made specially for me by Mr. J. T. Sandell, the courteous manager of Thomas & Co.), and I find that, coupled with a coating of adequate thickness, this is a complete cure for halation. I advise all who have to take "interiors" with troublesome windows to try this plan. Another well illustrated advance to be seen at the palace is in the use of compressed gases in steel cylinders for the lantern, instead of the large rubber bags which have for the last thirty years been universally employed in this country. Messrs. Steward, of 406 Strand, have "perfected" the cylinder system by the introduction of a compact pressure gauge which shows when required the exact amount of gas remaining in the cylinder; and by the application of Beard's automatic regulators, one of which, screwed to each cylinder, permits the gas to escape with uniform and not excessive pressure.

These two "affairs"—the Conference and the Exhibition—taking place in the spring of the year, just when "young men's fancies lightly turn to thoughts of" photography, will undoubtedly give a fillip to trade. That the popularity and prosperity of such reunions may continue to increase is the sincere wish of

TALBOT ARCHER.

LESSONS FROM MY ALBUM.

BY W. E. PARTRIDGE.

My first attempt at photography was made in the spring of 1879. Gelatine dry plates were just making a noise in the world. Time and business prevented me from trying to make my own plates, so I began with plates which were purchased. They were some kind of emulsion and cost \$1.50 per dozen for $3\frac{1}{4} \times 4\frac{1}{2}$. They were slow, probably slower than any bath plates ever made. At that time there were no gelatine plates to be had. Some of the stock houses had gelatine emulsion for sale, but did not think it would pay to handle dry plates.

Later in the season gelatine dry plates were in the market. I did not attempt to make any plates for myself. Of the modern army of amateurs who buy their plates, I think I may claim to be the first recruit, the oldest of the dry plate amateurs who are not also plate makers.

A few months after I began, and had reached a point where I was at all certain of getting an image on the plate—not always an easy thing in those days—I was persuaded to buy a very large album in which to mount my prints. With a courage which commands my admiration at the present time, I began mounting in it samples of almost everything I printed. In later days I should not have had the gall to do such a thing, but as the habit had been begun I have kept it up to the present time. My album, or albums, now contain prints of nearly all practicable negatives which I have made, as well as a great many by professionals. In my collection I have some forty or fifty imperials of actors, authors, actresses, etc. These were all purchased prior to 1877; many of them were made in 1874 and 1875.

Of the prints which have been mounted in my larger collection there are a large number of various kinds by professionals. In style they are varied; nearly every process is represented—silver, platinum, “cyanide” or “blue,” bromide, collodion, bichloride of mercury and silver are all represented. Many of my negatives have been sent to professionals for printing. Some prints I have made myself. There are nondescripts about which I know very little.

Ten years have written their story across many of the pages. Time has shown that a deeper history can be written in ten than in eight years, or less. I find in going over the pages there are very many important lessons to be learned. These lessons may be of service to others besides myself.

With a single exception all the silver prints of the earlier dates show signs of fading. This includes those that were purchased mounted and those that I mounted myself. As I did not attempt to make silver prints myself until about six years ago, my own work does not count. The exception is a landscape taken away down East. The print was made in 1866 or 1867, and put under glass—not a tight frame. The picture to-day is as clear and the lights as pure as when it was first mounted. It looks like a new picture now. Unfortunately I know nothing in regard to its production. For half of its life it has hung upon the wall.

In the silver prints there are several kinds of deterioration. That which shows itself first is the failure of the burnished albumen surface. This has taken place in all the prints. The unburnished surfaces are to some extent troubled in the same way. The fibres of the paper, compressed by the burnisher, finally swell and destroy the surface. They present a network of fine lines over which the

albumen gloss appears like a varnish. The higher the burnish, the worse the result.

This fault destroys the bloom of the picture usually within a year. A few last twenty months, and here and there one keeps its surface for two years.

The mountant in my album has been "Daisy" paste, flour paste freshly made, and, within a year, fish glue as an experiment. A few prints have been glacèd by squeegeeing on glass. These have been mounted by the edges. Some of these are now more than two years old and still retain a very good surface.

Of the perfectly permanent prints, first and foremost on account of number are those in "blue." I cannot detect the slightest alteration in any of them. The high lights are as pure and the shadows as intense as any I can produce to-day from the same negatives. Ten years have not developed visible changes in them.

Platinum prints rank nearly as high. Time, however, has not been as gentle with them. Here and there I find one in which the whites have become degraded. A portion of this appears to be due to the use of hydrochloric acid in the washing waters and wood pulp in the paper. I believe part of my prints washed in citric acid waters have not yellowed. But here I am confronted with a sample print by Willis & Clemens in which the whites are perfect after seven years. I think the firm always used the hydrochloric acid for clearing. Several prints by Mr. Needham are perfect, though they have been in my book for over five years. Of course the platinum image is beyond suspicion of fading.

The bromides have not as good a record as I could wish. There are many enlargements from negatives now lost or destroyed, and these prints are fading. All of them lasted eight years before showing any sign that they would be fugitive. One of them has already handed in its checks and passed away within two years. A yellowish brown stain begins at the edges, and gradually spreads over the whole surface, obliterating the image as it advances. One print, however, is thoroughly yellow, with the image intact. I hear the older men softly whisper "hypo." That is a good answer. There is no way of disproving it. It will apply as well to the silver as to the bromide prints. My private opinion of the hypo theory in such cases is that it is "Humbug"—spelled with a capital. It might have been a good answer in the early days and fitted most cases, but it has become a very ripe chestnut. I had a lot of fine silver prints, some of which I have mounted. A part of these turned yellow at once. When I asked the reason for this, the old answer came, "Hypo"! That, I thought, was fine, it was so appropriate, because after those prints had been finished by the photographer I had, in an endeavor to glacè them, washed them in two or three waters and soaked them twenty-four hours. The water had more to do with the yellow than the hypo.

I became so sick of this answer that three years ago I mounted some prints which will fade "with a whereas." They are already turning red in streaks and bleaching. I shall one of these days show them to an expert, and, after being told that hypo is the cause of the failure, shall proceed to explain that the paste used in mounting was preserved with bichloride of mercury. I think that will rather crush the hypo theory.

I have two very beautiful collodion prints. They were made in the camera on glass, developed and then transferred to paper. Neither the image nor the whites have changed in the least. The color is almost an engraving black.

The film is on the surface and is not protected. It is wearing off slightly by contact with the opposite page.

A number of bichloride of mercury and nitrate of silver prints are worth study. The deep shadows are nearly black. The half tones are slightly warm, and the high lights almost as pure as those of a blue print. Two years of life have not yet developed any change. The method, which is a sort of chloride of silver printing, appears to be worthy of further trial. I found the process somewhat uncertain and was not able to manage it upon an albumen surface. My failures were probably due to a lack of skill in sensitizing and in the use of the silver bath.

In regard to the quality of the picture, the purest high lights and the softest gradations, and, altogether, the best prints, whether new or old, are those made on "blue paper." The total color scale is wider in them and they show greater brilliancy than any others. Nearly, if not fully, equal to these, are the platinum prints made by the professionals from very "plucky" negatives. But even the professional has hard work to beat the results given by the blue print. For small pictures a glossy surface is needed, to prevent the grain of the paper from hiding the details. This leads us to wonder why we cannot have blue prints on albumen paper.

The silver prints fresh from the burnisher, when compared with those made on blue paper, show a sad degradation of the high lights. Although, nominally, the highest light in the silver print is white, yet it is very rare to find one in which the white can be found. In this respect the untuned print is much more beautiful. It is true that the foxy-red color is not very pleasing at first, but the color scale is much longer than after toning. The whites are pure and the delicate gradations are all that can be desired. I have nearly a dozen of these untuned prints; they are fading, of course, but not badly. The beauty of their gradation makes one forgive their color. This, after all, is not so far removed from the sepia of the old masters.

The collection made during the last ten years teaches an art lesson that I shall not forget. In a word, it is to make more of the foreground. The amateur is usually inclined to make his pictures at a distance and forget the shrubs growing within ten feet of his instrument. With my early apparatus it was impossible to get a good foreground in focus and at the same time give a distance with any reasonable degree of satisfaction. With the better lenses which are now within the reach of almost every one, it is quite possible to get the foliage close by the instrument, as well as the more distant landscape. It is wonderful how far a good foreground will go toward redeeming almost any photographic composition from failure.

Parts of large pictures are often better than a print from the whole negative. At different times a friend has given me scraps cut from large prints, or prints from parts of negatives. Some of these are not more than an inch square. Several are almost microscopic, and such perfect compositions that we wonder how one could wish to include more by using a larger plate. This is a lesson on the value of long-focus lenses and a rebuke to that general desire for the Earth. The wish to "take it all in" spoils many a negative.

By all means, I advise, buy an album and mount good prints from every negative made. As years pass, new beauties will be found in them. Plates made to obtain an effect, and rejected because it escaped, may prove in after

years to have a peculiar charm of another kind. Negatives that were thought worthless may in time develop beauties which were at first all unnoticed. A failure in some detail often disgusts one with a negative which will really give beautiful prints. It does not follow because a point has been missed that the picture has been ruined. The lapse of time often renders a negative valuable. A change in a scene, the removal of a landmark, associations and a thousand other accidents may combine to make the print a joy in other years.

Discoloration of silver prints is a sore point with me. Beyond the fact that they are not permanent, it is difficult to interpret their behavior. Nearly all of them have turned more or less yellow in the whites. My printing in the last ten years has been done by many different men. None of the prints are exempt from this fault. There are a few prints toned by myself which, though of the usual color obtained by amateurs, have not changed, and are to-day clear and bright. One dated 1882 is as good as when first mounted. Another, however, made at the same date or a year later, is discolored in spots and actually fading.

There is a general change in the color of the silver print image before it begins to fade and usually before the yellow begins to invade the whites. Two prints made by Carlo Ponti, of Florence, are now seven years old. The tone of one is a dark, rich purple, nearly black. This is as good as when first mounted. The skies are pure white. I think in one of them a yellow stain begins to show at one corner.

Apart from the yellowing by age, there is another that is making havoc with the prints. Along the edges a yellow line makes its appearance. This gradually grows wider, and as it spreads, not only discolours the paper, but to a considerable extent bleaches the image. This trouble is confined to the prints in the large album. Those mounted when purchased are quite free from this trouble.

I know of nothing in the history of the prints, or of their mounting, which explains these changes. Being all in the same album, there is no probability of differences in the mounting board which would account for them.

The tone, contrary to the general opinion, has had little influence upon durability. Unfortunately I have no examples of the blue-black silver print. Some of those having the most abominable foxy red tones have not changed perceptibly. One print made in 1884, and having nearly a bromide tone, is still in good condition.

The untuned prints, mounted a year ago, are losing a little of their foxy color. This is probably the first step toward complete fading, which all the books tell us is certain.

The few experiments I have made, as well as what I can learn of the treatment of some of these prints, lead me to think that too much washing is as dangerous as too little. Washing over night appears to be longer than is desirable.

I may be pardoned a few conclusions. Of the prints I have mounted, I have no hope for the permanence of any, save the "blues" and the platinums. I think it only a question of time when the others will disappear entirely, leaving only dirty yellow patches to remind me of the things of beauty which have been. The photographs which were mounted when purchased may last longer. Their beauty as pictures has already passed in most cases. Most of them remind one of pressed autumn leaves. Yellow prevails and masters everything.

Of blue prints transformed into the gallate of iron I have a few. Some are

good, with fair high lights. They have too much purple in the black to be pleasing. Their permanence is beyond question, as far as can be shown by a five years' experience.

Some of these prints smut the opposite page, showing that they will ultimately suffer from actual wear.

We need a good printing process. It has not yet made its appearance. In small sizes it should have a glossy surface, while above 8 x 10 or 10 x 12 it should be matt. It ought to give as brilliant results as the blue process and be as simple. The tone should be a pure black in the deepest shadows. The engraving is the standard. The artists do not want the beastly photographic purple to represent landscapes. Those who do, can use silver.

While I hope we may get it, I confess that my faith is small.

A TALK BEFORE THE BOSTON CAMERA CLUB ON COLLODION EMULSION.

BY E. MILLIKEN.

THE enthusiasm of the Camera Club in the matter of lantern slide making, and a desire that you may see and know for yourselves the ease with which collodion emulsion is prepared, are probably the principal reasons why your Secretary has invited me to give a talk on the subject.

I have seen, shown here, lantern slides made by the wet plate process, and also some made on gelatine dry plates, but none on collodion emulsion plates.

It cannot be such plates are unknown to you, but rather, I think, to the belief that to prepare them is a difficult as well as a delicate matter. Herein you are in error, for, as you will shortly see, the preparation of the emulsion is comparatively an easy task.

The principle to be followed in the preparation of the emulsion is to employ a considerable excess of soluble bromides. Those of you who are familiar with the formula for gelatine emulsion only must not think that the same rule holds good in collodion, for such is not the case. In the former it is generally held to be immaterial how much excess of bromide, within reason, is used; but in a collodion emulsion every grain must be taken into account in estimating the probable sensitiveness of the preparation. What in the case of gelatine would be a small excess, in collodion would be a very large one.

The formula which I have used is :

Cadmium bromide.....	30 grains.
Ammonium bromide.....	15 "
Alcohol.....	2 ounces.
Sulphuric ether.....	2½ "
Pyroxaline.....	20 grains.

Put the cadmium and ammonium bromide into a 6-ounce bottle, and add the alcohol and ether. A vigorous shaking for a few minutes will dissolve the greater part of the bromides. The pyroxaline should then be added to the bromized solution, which should be allowed to stand for a day or two, being shaken occasionally, when it is ready to be sensitized. To sensitize the above quantity, dissolve in a test tube, by heat, 50 grains of silver nitrate in half a dram of water, and add 2 drams of alcohol, previously heated in another test tube. The alcohol solution of silver is added, a little at a time, to the bromized collodion, with vigorous shaking, and the test tube finally rinsed with 2 drams of

alcohol, which is added to the emulsion, making 5 ounces in all. Of course the sensitizing of the collodion should be done in the dark room, although it is not necessary to be as particular as to the light as with gelatine emulsion. You can allow yourself a very liberal quantity of either yellow or red light.

When the emulsion is first made it is rather thin and blue; but if set aside, protected from the light, of course, for about a week, it ages or ripens, and becomes creamy in appearance. To a certain extent age improves it, but it is not advisable to use it after it has been kept as long as three months. The emulsion having ripened, should be filtered through cotton wool, a plug of which should be loosely put into the neck of a glass funnel and moistened with alcohol before using.

The plates which it is proposed to use should be thoroughly cleaned, dipped into an albumen solution and set aside to drain and dry. The albumen solution is made by dissolving, by the aid of vigorous shaking, the white of one egg in three pints of water, and filtering through cotton as previously described.

After flowing the plate, allowing the excess of emulsion to run off, but not back into the emulsion, and after the film has set, wash in several changes of water, or under the tap, until the seeming greasiness disappears, when it should be flowed with the preservative, which may be strong tea or coffee or a solution of quinine made of :

Tincture of quinine.....	2 drams.
Water.....	5 ounces.

After allowing the plate to drain for a few minutes, dry at once, and preferably by heat. I dry in the oven of the cook-stove, being careful that it is only moderately hot.

The plate, having been exposed either to artificial light, for a contact plate, or in the reducing camera, is ready for development.

The exposure should be about four times as long as that given a very slow gelatine plate. You must bear in mind that collodion emulsion cannot stand the amount of alkali in development that gelatine can.

The solutions required for development are:

Pyro.....	3 grains,
Water.....	1 ounce;

and for an alkali any which you are accustomed to use and have on hand, either ammonia or potash.

In addition will be needed a solution of alcohol, two parts; water, one part. Place the exposed plate on a leveling stand; a small graduate or tumbler will do as well; flow over it the alcohol solution, allowing it to remain on the plate for about a minute, which softens the film; then pour it off, and wash with water until it will flow evenly over the surface. Having put into a graduate the quantity of pyro solution you propose using, add to each dram of it two drops of alkali and flow it over the plate. The image will develop up with little of density, being seen by reflected light to be of a bluish-pink color; by transmitted light scarcely at all. When the detail is well out pour back into the graduate the developer on the plate, and having added two drops more of alkali to each dram of pyro, again flow the plate, pouring the developer on and off until requisite density is obtained; then rinse with water and fix in comparatively weak hypo, say one to six.

It takes fully as long to describe how to develop as it does to develop.

I have never heard of hydroquinone being used as a developer for collodion emulsion; but as it is composed of bromide of silver, could see no reason why, as it would develop gelatino-bromide plates, it would not also the collodion emulsion. I tried the following:

Hydroquinone.....	10 grains.
Soda sulphite.....	80 "
Potassic carbonate.....	60 "
Water.....	2 ounces.

Taking equal parts of it and water, the result was fully equal to that obtained by using pyro. It is necessary, however, in using hydro, to over-time rather than under-time, as forcing the development has a tendency to fog or veil the high lights.

An advantage which the collodion emulsion has over gelatine is that if from any cause the plate, after developing and fixing, is weak and flat, it can be intensified, like a wet plate, that is, you intensify only the dark portions, the lights remaining clear; to do this, flow the plate with a solution of one and a half grains of pyro to the ounce of water, to which has been added a few drops of a solution composed of:

Silver nitrate.....	30 grains.
Citric acid.....	20 "
Nitric acid.....	10 drops.
Water.....	1 ounce.

Be careful not to use this too freely or a bad color and coarse image will result.

If desirable the plate may be toned by using the spent gold bath which has been previously used for toning prints.

Apropos of the above, we have used the following gelatine emulsion with good success in lantern slide making, it being about one-quarter the rapidity of Carbutt B plates: Into a tumbler put of

Potassic bromide.....	56 grains.
Heinrich's gelatine.....	80 "
Water.....	3 ounces.

Heat in a water bath to 130 degrees, and when all is dissolved, add slowly, with constant stirring, 60 grains of silver nitrate, previously dissolved in one ounce of water; put aside to set. When thoroughly set, we generally wait until the following day; shred by pressing through what is called coarse railroad canvas; wash in four or five changes of water; drain, remelt, filter through fine flannel, and coat plates, allowing 1 dram of emulsion to each plate of lantern slide size.

[*Transactions of the Edinburgh Photographic Society.*]

SOLARIZATION.—FROM A THEORETICAL AND PRACTICAL STANDPOINT.

BY HUGH BREBNER.

As this is the first time that I have addressed the Edinburgh Photographic Society upon this subject, I had better begin by stating that it is fully a year and a half since I commenced the experiments whose principal results I propose to touch upon to-night.

When a piece of sensitized, albumenized paper, exposed for a few minutes to sunlight, is torn in halves, and one of the pieces is turned face down, and both are again exposed for a period equal to the first, it will be found that while the piece exposed from the front and the back is lighter than the other by reflected light, by transmitted light it is considerably darker, although, through the light having had to penetrate the paper support, it may be considered that less has reached the film. This, among other things, tends to prove that light in reducing chloride of silver erects a barrier in its own path, as far as the rapidity of the formation of a visible image is concerned.

A gelatino-bromide dry plate behaves in the same way with regard to the visible discoloration of the film, though to a much less perceptible extent.

When fixed, without development, of course, the density is proportional, though not directly proportional to the duration of the exposure, the greatest alteration taking place in both cases at the outset. Still, the invariable rule obtains, that, under similar conditions, the longer the exposure the greater is the density.

The addition of a solvent of silver salt facilitates the discoloration, at least up to a certain point, after which the difference of graduation is so light that it is difficult to observe with sufficient accuracy. The discoloration is also promoted by alkaline solvents more than by those which are neutral. Acids added to either form of film greatly retard or prevent a visible change, according to their power of dissolving the haloid salt, or of oxidizing the metal produced.

(The foregoing notes are to be taken as general rules only, to which exception may be taken or be found. They are points of great theoretical interest, and though, personally, I am inclined to believe in an electrical action on the part of light, yet I would not put forward the foregoing save as a provisional classification of the great bulk of our observations of photographic phenomena.)

When a dry plate is first exposed and then "developed" so as to obtain pictures in the ordinary way, the preceding observations apparently hold good as far as the treatment of the film by solvents—alkaline, neutral, or acid—go. But over-exposure, solarization, or reversal, advance deeper problems for our solution.

Before summarizing the results I obtained by a somewhat extended series of experiments, let me attempt to define the composition of the developer, seeing that such a definition as I could give formed the basis or working hypothesis upon which my experiments were undertaken.

A developer is essentially a solution (or vapor), from which metal is deposited upon a light-produced nucleus. It is customary, however, to restrict the term "developer" to ingredients in it which throw down the metal. Nevertheless, I hold that the development of a daguerreotype is in principle the same as that of a calotype, wet plate, or stripping film, and differs from intensification with corrosive sublimate only in so far as the attracting nucleus is in the one case invisible, in the other visible, and the vehicle a vapor and an aqueous solution. Practically speaking, however, a developer consists of a solvent and a depositor, one or other being generally an accelerator—or an electro-positive body similar in its action to the more refrangible rays of light, those of metallic or basylous origin. Thus in ammonio-pyro development we have—

Ammonia.....	= Solvent of Ag Br.
Pyro.....	= Depositor.
Ammonia.....	= Accelerator.

And in ferrous oxalate development—

Potassium oxalate.....	= Solvent of Ag Br.
Ferrous oxalate.....	= Depositor.
Ferrous oxalate.....	= Accelerator.

The fact that we can develop an image of the open mouth of an ammonia bottle—exposing and developing in the dark—sufficiently proves that the term “accelerator” is by no means superfluous; and to me the experiment affords one more proof, that there is a closer affinity between the action of light and that of electrical disturbance than is generally acknowledged.

By means of using apertures for objects in camera work, and for *clichés* in contact printing, I was enabled greatly to lessen my own trouble and simplify observation; while, by causing the exposures to overlap each other, I could easily get a hundred different periods represented on the same plate for twenty-five exposures actually made. I had six methods of working. Two in the camera—exposing on a circle of ground-glass illuminated by diffused daylight, and on a gas flame. Two by contact in the printing frame—by direct sunlight, and by gaslight. And two with naked plates—exposed to sunlight and to gaslight. While, for the most part, I developed 4, 12, 24, or 100 exposures in the same developer, simultaneously and for exactly the same length of time, I found it impossible to work with anything like precision, the inconstancy of the developer and the absence of an automatic exposing apparatus being my chief difficulties. I had, therefore, to multiply my results, take averages, and, in the case of the more protracted exposures, resort to inspection by ordinate and co-ordinate.

From several thousand exposures I came to the following conclusions:

A. That when the film of bromide of silver is inconsiderable in thickness, the action of a strong light is instantaneous, complete, and irreversible:

B. That with the seven brands of commercial plates upon which I further experimented, the facility of reversal, estimated by the duration of the exposure required to produce a given result, in conjunction with a constant developer employed for a fixed period, was greatest with the plates thinnest in silver, or with those with which it was difficult to get sufficient density. Edwards' most expensive plates and those of our own make required the longest exposure.

C. Taking the ordinary negative image obtained in the camera, and the ordinary transparency obtained by contact with a negative, as the normal, the phases of reversal and re-reversal stand thus: 1, normal; 2, neutral; 3, reversal; 4, second neutral; 5, second normal; 6, third neutral, etc.

D. If the normal be produced with an exposure, x , and the first neutral (invisible) with an exposure, $n x$, then the first reversal will be obtained with an exposure, $n^2 x$, the second neutral with an exposure, $n^3 x$, the second normal with an exposure, $n^4 x$, and presumably so on; *e.g.*,

Normal.....	5 seconds.
Neutral.....	90 “
Reversal.....	1,620 “
Second neutral	29,160 “
Second normal.....	524,880 “

E. Conjointly with light the reversing agent was found in the accelerator. An exposure calculated to give perfect neutrality, with a developer of a given strength used for so long, could be kept a fair normal by reducing the accelerator and adding restrainer, or it might be turned into a decent reversal either by prolonging the development or by increasing the proportion of accelerator. Restrainers restrained reversals in exactly the same way and extent as they restrained the normal image. The depositor also apparently played its customary part.

There is one point to which I would specially attract the notice of all theorists. While, practically speaking, we can easily see that the sum of the effect is due to the combination of "solarization" and "halation" as we term them, the real question which underlies the whole matter is this—Why, with a constant plate, light developer, and period of immersion, do different exposures give opposite conditions of transparency and opacity in the portions upon which the light was known to have impinged for the greatest length of time? The portions which exhibit halation, the portions which got least light, these also exhibit the phenomenon of solarization. Hence, to attribute the latter to the former, is equivalent that the secondary effect is the cause of the primary impulse.

I am attempting at the present time to reason out whether or no the interference and polarization of the light—which interference and polarization must of necessity exist to some extent—can have anything to say towards a solution of the mystery. The subject is a very difficult subject indeed, and positively bristles with subtle and undecided optical problems. With my own conviction that electrical currents are greatly concerned in the manifestations you are already familiar.

There are many other points connected with this subject which I should greatly like to touch upon, but I have already perhaps rambled too far. Let me then conclude by giving you the exact conditions under which I obtained negatives from negatives.

I took what I consider a perfect though possibly a rather thin negative—a stronger one would have given better results, and would have been more easy to manage—and I laid it in an ordinary printing frame in the usual way. In the dark-room I placed an "Ilford ordinary" plate against it, so that the films were in contact, and throwing aside the "backing" lest the pressure should break the negative, I shut the frame.

Having found that twenty-seven minutes' exposure of a sharp aperture cut in a piece of wood gave me the best reversal, I decided that at least twice this exposure would be needed to allow the light to just penetrate the most opaque portions of my negative, under the conditions of illumination under which I had been previously experimenting, namely, at about 6 inches from the gas-flame from a No. 3 "Bray" burner. An exposure of fifty-four minutes having proved too long, the reversal obtained being too clear and feeble, I tried forty-five minutes, and with such success that I have stuck to that exposure—for the same quality of negative, of course—ever since.

My developer for this was:

Pyrogallol.....	4 grains.
Ammonia.....	1 minim.
Ammonium bromide.....	.05 grain.
Water.....	1 ounce.

And my object in employing such a weak developer was to protract the time sufficiently to allow me full time to see what I was doing, as there is considerable difficulty in judging when the high lights are dense enough, on account of the general and unavoidable fog. I held a second developer, with twice as much ammonia and bromide, in reserve, but upon this occasion I did not use it, though I have done so since, and got equally good results in less time.

On arresting the development, a more hopelessly fogged-looking production pretending to intend to pass for a negative I had never seen. As experience had taught me, however, first impressions are occasionally not to be relied upon, so I immersed my work of art in the hypo without many misgivings. On taking it out again, I was at first, by the light of the dark room lantern, a little disappointed, but a stronger light minimized the appearance of fog and "maximumized" the density of the high lights.

"The proof o' the puddin' 's the preelin o't!" When prints from the original negative and the "reversal" were submitted to an expert, all he said was that he couldn't see any difference between them; that if anything he liked number two best, because the modeling marks did not show so much; but that, if I had not assured him to the contrary, he would have taken them to be prints from the same negative, the plate-imperfections being the same in both. I did not tell him that while one of the prints took minutes the other took hours—not an equal number of each, however. Since that time I have made a good many negatives by the same process, but, having been taken for pastime, I gave them away readily as curiosities. Several shorter exposures were developed with developers of the normal strength, both pyro and iron, and at this distance of time I cannot tell whether they compare favorably with the slowly developed negatives or not; I know they were more uncertain.

The light, the distance, and the three-quarters of an hour, however, may be accepted, I venture to say, as standards of reference by any practical hand desirous of repeating this experiment.

[From the *British Journal of Photography*.]

NOTES ON COPYING.

BY EDWARD DUNMORE.

PERHAPS of all photographic operations copying is the most universal. There are few, if any, who, practicing photography, have not at some time or other to make a copy. The intention of the writer is to review the different kinds of copying and the means taken to procure satisfactory results.

Copying may be defined as the reproduction of anything that exists on one plane (in contradistinction to photographing, which includes the reproduction of every visible thing on one plane or many) on a plane surface; a distinction, perhaps, in some cases with very little difference, but still sufficient to explain what the term "copying" in this article is intended to convey.

The methods required are very varied, each particular class of subject necessitating its own particular treatment to get the best results. The different subjects may be classed under the following heads: Black and white in lines or dots, as engravings, etc.; black and white with half tone, as Indian ink and pencil drawings; colored subjects, as water-color drawings and oil paintings, old manuscripts, daguerreotypes, and glass positives. To begin with copying a line

engraving; this is perhaps one of the most easy subjects to which photography is applied, and yet one that seems in many instances to be so difficult with gelatine plates that the old wet collodion process is still used in preference. The first thing to do is to set up the engraving to be copied exactly parallel with the focusing screen, and the lens exactly central with regard to the subject. If the camera is not properly arranged the lines in the copy will be out of drawing. The focusing must be as sharp as possible, and a small stop used. This part being satisfactorily arranged, the illumination must be next attended to. The difficulty of doing this increases with the size of the sheet to be copied. It is absolutely necessary that the whole surface should be equally illuminated, and the way of doing it is regulated in a great measure by the disposition of the windows of the work-room. If the source of light is from one side or top only, white reflectors will be necessary; in the usual glass room a sheet of white paper, placed on an angle below the engraving to be copied, will generally suffice. A wide-angle lens should not be used; a rapid rectilinear, symmetrical, or triplet lens is the best, and not worked to the full extent of its covering powers. If a short-focus lens is used and the reproduction is required of the size of the original, the camera has to be placed so near the subject that it will probably interfere with the evenness of the lighting by cutting off most of the front light, or the perspective will be distorted. The exposure is the next thing; it must be just so long that the black lines are free from any reduction in development. The longer it is short of this the better, bearing in mind a rapid development on a well-exposed plate gives a much blacker image than if the development is prolonged. The rule in wet collodion was short exposure, and weak, well restrained developer; with gelatine the developer must be well restrained, but not particularly weak, and the process must be stopped before any reduction takes place on the lines; any veil on the shadows is a fatal objection, especially if the negative is required for photo-lithography or mechanical printing; the plates used must therefore be such as will work absolutely free from fog of any kind. All diffused and reflected light must be carefully guarded against; none whatever, except that forming the image, having access to the plate. The camera should be dead black inside, with a diaphragm, if the lens used covers much more than the size of the plate—in fact, every precaution should be taken to insure brilliancy of the image. It is an advantage to fix the plate in a hypo bath to which iron sulphate has been added, wash well, and dry. If on examination after drying the lines look clouded, they may be cleared by immersion in a weak bath of ferricyanide of potassium and hypo. Care must be exercised in doing this not to overdo it. If the plate is left in too long, or the bath is too strong, the image will be reduced unequally, and the negative spoiled. If the exposure has been so short that a very thin image is developed, there is a good deal of extra trouble in getting a sufficient density by any method of intensification. The longer the exposure the more easy it is in this respect, and the after treatment with ferricyanide permits a longer exposure than could otherwise be given. Wash well, and proceed to intensify with mercuric chloride, followed by sodium sulphite; this process can be repeated, washing well between each application, until the necessary density has been gained. In all cases the application of an iron salt to the film facilitates intensification. Ferrous-oxalate development would probably suit this class of work, but my experience has been with alkaline pyro, which I have found to answer every purpose. There should be no difficulty in getting an absolutely

black and white negative. In case of the ink or the lines being glossy, extra precautions must be taken to avoid reflected light from them, by cutting off all direct front light, which is best done by a black cloth screen with a hole in it, through which the lens can be worked. Black and white subjects with half tones require quite a different class of negative, much less dense.

The preliminary adjustments are the same in all cases of copying, the difference being in the exposure and development. A somewhat longer exposure, and the development carried sufficiently far to give sufficient density without any after intensification, is best—absolutely clear glass on the shadows not being imperative. If we have to copy an ancient manuscript, yellow with age, stained and unequal in tint, as most of them are, the treatment depends on whether it is desirable to ignore the marks of time and bring it out in black and white, or if it is better to represent the discoloration. In the latter case we proceed as if copying a black and white subject with half tones, using an orthochromatic plate, by which means the yellow and brown are much reduced in force, and give a fairer representation of the original. Extra density may be obtained in the usual way with mercury and sulphite, providing the first development fails to give sufficient. A good deal depends upon the amount of discoloration; at any rate perfect opacity is not required. There is no doubt in dealing with colors the orthochromatic plate has great advantage over ordinary ones, whether used with a screen or without. In copying pencil drawings, a short exposure and development with an extra quantity of pyro is indicated as soon as the slightest veil comes over the darkest pencil lines; stop the development, fix, and get sufficient density by after intensification; it is not requisite to get perfectly opaque lights and clear shadows, although they should be fairly so, as this would do away with the characters of the pencil and give the appearance of pen-and-ink drawing. The print should be made on a mat surface paper, which is preferable for all work of this class; if albumenized paper is used, the toning should be continued till all warm color is gone. Platinum and bromide papers lend themselves excellently well to this purpose. The water-color drawings—in fact, all subjects depending much on their color for effect—are best rendered by orthochromatic plates, there is no shadow of doubt. Water-color and oil paintings require much the same method of treatment in taking the negative, but oil paintings require special care to avoid reflections. This is best managed by screening off all direct front light, which necessitates somewhat longer exposure; but the advantages are manifold, and a little longer time in these dry-plate days is not worth consideration. Water-colors will not bear any rubbing of the surface, but all dust should be removed by a broad camel-hair duster. Fix them flat against a board, with drawing pins, or any other contrivance that will effect the same purpose, right way up; let the light fall on them from the same direction as that in which they were painted; this also applies to oil pictures, for sometimes the color is laid on so thickly, the artist depending for some of the effect on shadows cast by the impasted color, that if the light is admitted from the contrary direction it will prejudicially influence the effect.

Where there is sufficient space a picture can be most easily copied in the actual studio in which it was painted. The arrangements for light in the painter's studio are generally such as to show the picture to the best advantage and to avoid reflections. Formerly this was out of the question; but in our modern style of working with dry plates this difficulty is overcome, and renders a picture

copied on the spot, so to say, more satisfactory than one done in any other place, for on a fairly bright day the exposure is not very much longer than that required in an ordinary glass room with the light screened off. There are no ugly patches of reflected light showing up the texture of the canvas and obliterating the painting, and even the sunk-in parts are not very pronounced. Many adopt as a preliminary to photographing the plan of sponging over the surface of the picture with glycerine and water or beer, leaving it moist while copying; either plan tends to equalize the surface and get rid of inequalities that would show as lighter or darker patches on the negative. It goes without saying that whatever is used must be removed with a sponge and clean water after the photographing is completed. Sometimes the colors are not quite dry when the picture has to be copied; this being the case, any application to the surface must of course be foregone, or the probability is the picture would be seriously damaged. In setting up the picture to copy, it is sometimes an advantage to tip it slightly forward, the camera being tilted to the same angle. As the wedges at the corners are sometimes loosened in carriage, they should be tightened up so that the canvas presents as even a surface as possible. The exposure for an oil painting is generally a little longer than for a water-color of a similar subject, the oils and varnishes used reducing the actinism. The exposure is almost entirely dependent on the intensity of the color acquired by the vehicles used with the prints rather than the colors themselves. Some very old paintings have so browned by age that the lights have about the same photographic effect as the shadows, thus precluding any chance of a satisfactory result. Unless the varnish is removed, an ordinary modern painting will generally be sufficiently exposed in five minutes, if reduced to a fourth of its size, and the stop being 64 U. S., on a plate of average rapidity; but of course so much depends on the light and other varying conditions that no definite time can be stated; but whatever exposure is given, let it be long enough: an under-exposed copy of a painting is but a caricature at best, and never is likely to give satisfaction. The developer should not be one calculated to give strong contrasts. When the image is thoroughly well out, wash and fix, and if deficient in intensity, intensify afterwards; better results will thus be secured than by prolonging the development, which is apt to destroy detail in the lights.

Glass positives are often required to be copied. In the first place, ascertain on which side of the glass the image is, for sometimes they are blacked over on the collodion side, and sometimes on the glass. If the black varnish is on the image itself, the first thing is to see that it is perfect; if not, make it so. Providing the glass side is black varnished it may be scraped off, and the face of the picture pressed against black velvet, so that the resulting copy may not be reversed. If the glass is fairly clean, the image shows as well on one side as the other, but providing bubbles and striæ interfere, the surface must perforce be copied; a reversing mirror or a prism will put it in the right position. No particular difficulty is attached to this work, or precaution required; avoid reflections and develop with any ordinary good developer. To copy a picture on albumenized paper is rather more difficult, there is such a tendency to granulations and coarseness in the copy unless some scheme is devised to avoid them. An unmounted print may be put into optical contact with glass, which will do much to remedy the evil. Place the print for a few minutes in a pan of clean water; when equally moistened lay it on a clear piece of glass, avoiding air-

bubbles; put a few folds of damp white paper at the back, on which lay another piece of glass. The print, thus sandwiched, will remain a long time in a suitable condition for copying, but if merely wetted and laid on glass it soon begins to dry irregularly, when a smooth copy is out of the question. Equally illuminate it, and there will be little difficulty in making a good reproduction. If the photograph to be copied be mounted, make it as flat and smooth as possible, and use strong light and do not over-expose. The granulations seem to be owing to particles in the paper, which reflect light irregularly, rather than roughness of surface, and which ought, with front lighting, to entirely vanish. We know from experience they do not, so the fault cannot be from this cause. The developer needs no particular notice; any good kind will answer.

Daguerreotypes require considerable exercise of patience and most careful handling, as they possess qualities of their own that are calculated to give the copyist considerable trouble. They are on thin metal, whose silvered surface reflects light like a mirror—is a mirror, in fact, and sometimes not a flat one—and the difficulty is to see the image without reflections and at right angles to it. Perhaps as good a plan as any is to take a small box—say a cigar box—remove one end, and at the opposite cut away about an inch of the lid, and line the box with black velvet. The daguerreotype is fixed flat against the remaining end of the box with drawing pins, and is illuminated entirely from the slit in the lid above. Place it directly opposite the camera, covering the lens mount and any bright surface with black cloth or velvet, and proceed to copy in the usual way. It will be noticed that the buff marks or scratches in polishing are more visible in one direction than another. The daguerreotype should be placed so that the light shines along and not across them; they look very unimportant on the metal, but in the copy they come out strongly, so special care must be taken to get rid of them as much as possible by judicious lighting; develop as for a copy of a glass positive.

On the border line between copying and photographing is the reproduction of brasses, medals, bas-reliefs, and casts. Anything in low relief should be copied in a strong side light, the subject being placed upright, the effect being entirely dependent on strong cast shadows; while marble and plaster casts require a developer well restrained, and great care taken not to over-expose. Bronzes, the same kind of lighting, but a less restrained developer. Brasses should be dulled by dabbing them over with putty to destroy reflections, and will offer no particular difficulty. In all copying the primary condition of success is the accurate adjustment of the camera, and the next the avoidance of reflections; these being carefully managed the rest of the process is comparatively easy.

ENLARGING ON PERMANENT BROMIDE PAPER.

BY G. D. MILBURN.

[Read before the Society of Amateur Photographers of New York.]

THE process of making bromide enlargements from small negatives is very simple. To the professional photographer it is a source of profit, and to the amateur a great pleasure; from a very small negative you can produce as fine a large picture as the finest engraving, and it is now well known that when a bromide print is properly made it is permanent in the full sense of the word. An easy way to construct a bromide enlarging apparatus, out of apparatus on hand, is to take your front focus view camera; place your negative in a proper

size plate-holder kit, and adjust the negative and kit (upside down) inside of the ground glass camera—that is, negative and film of negative next the lens. Place the camera on a small table, and move the table and back of camera against the window in an ordinary small room. (See Fig. 1.) Shut out all the white light in the room, except that which enters through the ground glass of camera. A magic lantern, with oil-burner, can be used instead of day-light apparatus described above. Extra quick bromide paper can be had for that purpose. Use

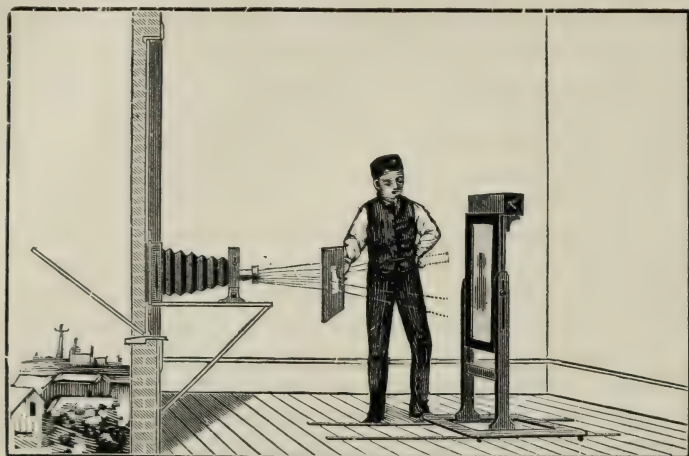


FIG. 1.—A COMPLETE APPARATUS.

most any good lens that is capable of covering the size plate you intend to enlarge from. Then you want an upright easel to suspend your bromide paper on, which is easily constructed out of two uprights, a flat board and a box of suitable size to serve as a base. The face of the easel should be covered with white paper.

Place your easel squarely in front of the camera. (See Figs. 1 and 2.) The size of the enlargement will depend on the focus of the lens and the distance

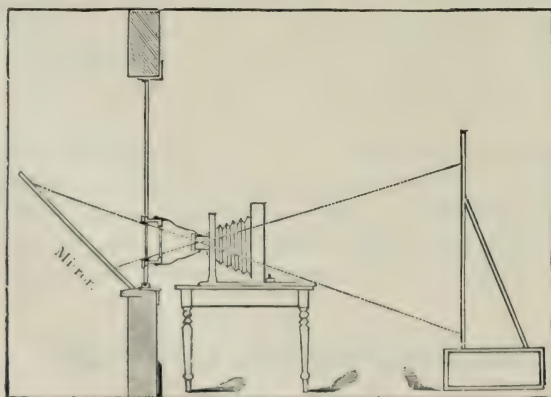


FIG. 2.—AN IMPROVISED APPARATUS.

that the easel is set from the negative. Move the easel back and forward until you have the required size. Then proceed to focus the enlarged image sharp. Now put the cap on the lens. At this stage of the operation it is necessary to have a ruby lamp in the room.

Another method of improvising an apparatus is to construct a shutter for the window, and cut a hole in the shutter two sizes larger than the largest negative to be enlarged from. Fit into the opening a frame about two or three inches

deep, glazed on the outside with a sheet of ground glass. On the inside edges of the frame, top and bottom, arrange grooves in which to slide the negative. Now, on a table or shelf adjusted in front of the negative box, place an ordinary camera, having the ground glass removed. Point the lens toward the negative, and connect the lens and negative box by means of a bag of opaque cloth, open at both ends, and provide with elastic band to close it tight around the lens and negative box. This will prevent any light coming into the dark room. (See Figs. 2 and 3.) If there are other windows in the room, they can be darkened with curtains. In case a portrait lens is used, it should be put in position so that the back lens will be next the negative instead of as shown in Cut 2; the easel to hold the sensitive paper is described above.

The best bromide paper to use is of The Eastman Dry Plate and Film Company's manufacture. I find that this is the most reliable, as well as the most permanent bromide paper on the market. Take a sheet of the bromide paper, pin it on the easel, uncap the lens and give it the proper exposure, which will vary from a few seconds to several minutes, according to the strength of the negative and light. If you are uncertain about the necessary time of exposure, pin a small piece of bromide paper on the easel to cover the most important part of the picture, expose and develop.

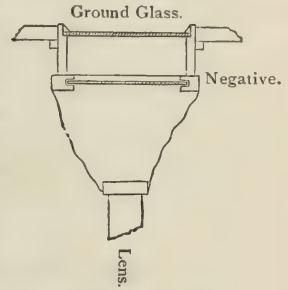


FIG. 3.—A PLAN VIEW.

This trial exposure ought to show you just how long to expose the full sheet of bromide paper, and will prevent waste. The best exposure is not less than twenty or thirty seconds. The lens can be stopped down to decrease the light if necessary. By giving the proper time of exposure, you can make a strong print from a comparatively weak negative, and vice versa. In fact, we have more latitude with the bromide process than any other photographic process known.

To make a vignette picture, the operator, standing at the left and half facing easel, should screen the lens with a piece of straw board about 16 x 20 inches. A hole of the proper shape for the vignette cut in the center. (See Fig. 1.) Having uncapped the lens, the vignetter should be moved back and forth from the lens to the easel. Continue this movement through the entire exposure. Additional time can be given on any part of the image that may need it, by cutting a smaller hole in the same size straw board and proceeding about the same as when vignetting. On landscapes extra time may be given on the sky by shading the balance of image with a piece of straw board of the proper shape; the most beautiful sky effects can be produced in this way.

My formula for developer is the same as that published by the Eastman Company:

No. 1.

Oxalate of potash.....	1 pound.
Acetic acid.....	3 drams.
Water, hot.....	48 ounces.

No. 2.

Protosulphate of iron.....	1 pound.
Water, hot.....	32 ounces.

No. 3.

Bromide potassium.....	1 ounce.
Water.....	1 quart.

To develop, take of No. 1, six ounces; of No. 2, 1 ounce; and of No. 3, half a dram. Care should be used in measuring No. 3, as an excess of bromide will produce too great a contrast, and too little will have a tendency to flatness. If you prefer to have your picture come up slow, this developer can be diluted with one-third the amount of pure water. In a suitable tray, soak the exposed print in clean water until limp. Then pour off the water and flow with the developer. The image should develop up strong, clear and brilliant. When the

shadows are sufficiently black, pour off the developer, and flow the print with the clearing solution, which consists of acetic acid, one dram; water, 32 ounces. Use a sufficient quantity to flow over the print. Allow it to act for one minute. Then pour it off and apply a fresh portion. Repeat the operation a third time. Then rinse in pure water and immerse for about ten minutes in the fixing bath. Hypo-sulphite of soda, 3 ounces; water, 16 ounces. After fixing, wash thoroughly for about two hours, and hang your print up to dry. A good method to force an obstinate spot, on the print, when developing, is to dip the fingers into the developer and slightly rub the obstinate part. Care should be used not to overdo it, and to have no other chemicals on the fingers, as it would leave a stain.

Beautiful results on bromide paper are obtainable with the hydroquinone developer.

To mount, wet the print, brush over the back with a thin starch paste. Lay the print on the mount and rub down with a soft damp sponge. Some operators would like to see the print retain the gloss, as when in the water this can be done by squeezing the print face down on a polished piece of hard rubber. When dry the print will peel off with a fine glossy surface.

A higher polished surface can be attained by enameling with the plain collodion process on a plate glass.

PRINTS IN FIVE MINUTES FROM EXPOSURE OF NEGATIVE.

REPLY TO U. I. E., BULLETIN MARCH 23D.

In your issue of March 23d you have a rather remarkable question in regard to getting a positive in five minutes from the time an exposure is made; the positive to be on a flexible material. Having had some experience in getting negatives quickly, perhaps I may be able to help U. I. E. with some suggestions. First take a negative on glass. But it is to be understood that a quick lens must be used and the light strong enough to obtain a full exposure. Develop this with a hydroquinone developer. I should prefer to use that put up by your publishers. With this I have just had a little experience under Mr. Newton's instruction. In a minute and a half or two minutes the negative should be ready for the hypo. If a quick fixing plate is selected it can be ready for washing in another minute. Here the real difficulty comes in, washing sufficiently to prevent the hypo in the film from injuring the positive. As an experiment I should try to print without fixing, using for the "flexible substance" a bromide paper. The thin, smooth paper made by Anthony & Co. will answer very well for this purpose. Again use hydroquinone. It will be sharp work to get the positive developed in the remaining two minutes, but it can be done. The positive will be finished so far as the appearance goes within the time named. It must of course be washed and dried. The question might be taken to mean a positive ready for inspection, and in such a condition that it might be shown. In this sense my answer would give a fair solution to the problem.

If the print must be finished and ready to take away, there must either be a few minutes added to the time or another printing process must be employed. More details in regard to what the finished picture must be, are needed. If for the finish of a race and positives are wanted which may be handed about even though somewhat damp and not perfectly washed, the process I have outlined would answer very well; as proofs of a portrait they would also do very well.

A finished platinum print is possible within three and a half or four minutes in a bright day with a good negative. The printing in that case would have to be in a camera, as the wet negative would prevent contact printing with platinum.

There is a great difference in plates in respect to the time needed for fixing. The same is true in developing. Some of the transparency plates made by Mr. Roche for Anthony & Co. would develop almost as soon as the developer touched them. They would fix in thirty seconds or less. The new hydroquinone developer works with great rapidity, and gives beautiful negatives, which print with remarkable speed, the deep shades being practically clear glass.

If a print upon a film would answer, one might be obtained by putting the film next the negative and thus preventing contact of the hypo with the sensitive gelatine. Quick washing and alcohol drying might enable the operator to get his positive within six or eight minutes and in a reasonably safe condition.

It would be interesting to hear from some of our older men in regard to the best method of getting a positive from an instantaneous negative in the least possible time. I have on several occasions had similar work to accomplish, and if any one can throw light on the subject, they will be conferring a benefit upon me, as well as upon the correspondent who asked the question.

In my own work the permanence of the print made in haste was of little importance. Others could be made later on which would take the place of those made in haste.

W. E. PARTRIDGE.

FLASH-LIGHT PHOTOGRAPHY.

To the Editor of Anthony's BULLETIN:

I receive a great many letters of inquiry regarding the best method of using the Reeves magnesium lamp, causes of failure, etc., and thought (if you can grant the space) it might be of interest to many of your readers to answer them through your widely read journal. First, in regard to interiors, a prominent inquiry is, "Where is the best position to place the lamp?" This, of course, must be regulated somewhat by the size of the room; but if a wide angle lens is used (and, of course, no other is so suitable), then the best position is on top of the camera, care being taken to have it stand firmly, else the jar, when the bulb is pressed, may move the camera. If lamp is not placed on top of camera it should be as near to right or left as possible; this renders the shadows less prominent. If lamp is forward of camera, the lens must be screened. I use a reflector of white linen held in place by sticks of cane placed upright in a half circle on a board. The cloth is varnished with silicate of soda to render it fire-proof. A large sheet of white cardboard answers almost as well. The lamp should be placed high up—six feet from floor is not too high. The readiest means of focusing is on the flame of an oil lamp. A prominent fallacy is that the lights in a room must be turned down or extinguished if in the field of view; this is not necessary unless the slide is drawn and lens open for a long time. Use as much light as possible—the flash then will not be so noticeable as in a darkened room; the burning lights also add greatly to the appearance of photo; they should be placed, if possible, so that the shadow cast by the magnesium lamp should appear to fall from lights in room. One cause of failure is, the bulbs are not pressed hard enough; it requires considerable force to expel the air suddenly; a motion like clapping the hands is a good plan—this adds the force of a blow to the pressure. Another cause of failure is damp powder; it is seldom thoroughly dry when received from the dealers, and will clog and form into balls. Put it in a tin can and bake it with a gentle heat on a stove or register, stirring occasionally; it will then become very light and powdery and is much more effective. (Readers will understand that I am writing of pure metallic magnesium.) Some of the first lamps made had an insufficient quantity of wicking in front of pipe bowl. It is a good plan to cover the whole of bottom of small pan with wicking; this, with the fire-proof backing we now supply for upper pan, gives sufficient flame to thoroughly consume every grain of powder. Through a mistake advertisements have stated the amount to be twelve grains; when bowl is level full the charge is about double that; it varies somewhat according to the purity of the metal. I receive frequent inquiries for a larger lamp; could make them, of course, much larger, using a bellows instead of bulb to fire the powder; but they do not answer so well if larger. If the flame is higher, the flash is *prolonged*, showing a movement in sitters. It is much better to use two lamps and fire them together; this doubles the power of the light, gives a much broader flame without lengthening the time of exposure. To fire two lamps take a bulb in each hand and clap them together.

I sent you an 8 x 10 print a few days ago, made with two lamps; it is of

group in very large parlor. By actual measurement it was 35 feet from lamps to end of room; as you will see, it is well lighted from end to end. I don't think the sharpness and detail would be exceeded if it was a time exposure by daylight. The lens used was a No. 3 wide-angle aristoscope with next to largest stop; there are few lenses would give such sharpness with so large an opening. I have written nothing concerning portrait work with the lamp, perhaps in some future number you can spare me space to do so; but it is in photographing interiors that the magnesium lamp has its greatest value, as they can rarely be got by daylight, at least where sitters are included.

Respectfully yours,

W. REEVES.

NORWICH, CONN., March, 1889.

THE PHILADELPHIA EXHIBITION.

(Continued.)

SAMUEL STORROW, of the Boston Club, had but one picture, but it was excellent; a view of a young chemist studying with anxious eyes some substance in a test tube. The title, "A New Silver Compound," was singularly appropriate, and the whole study was very artistic, the lighting of the face from the side window being particularly good.

Richard H. Lawrence, of the New York Society, had a number of fine views of French scenes enlarged from 4 x 5 negatives upon bromide paper. The work was finely done.

H. Harrison Suplee, of Philadelphia, exhibited a large number of pictures, many of them gems of artistic composition. It is impossible for us to note all the good things in this collection, but we were especially pleased with "The Swing;" "Light of the Harem," a flash-light study; "Daphne," another flash-light picture; "The Rest by the Way," a very pretty scene, and the "Reward of Merit," a dog jumping for some morsel in a lady's hand.

Wilfred A. French, of Boston, had an excellent study in the picture "Drink, Pretty Creature, Drink," a lady drinking at a roadside spring. He also had two charming views in New Hampshire, "A Peep through the Willows, Thornton Hollow," and "Artists' Retreat, Waterville."

Horace C. Dunham showed a frame with three pictures of roses, beautifully done, and possessing some of the finest gradations of light and shade we have ever seen in flower photography.

John C. Lee, of the Boston Club, had two studies that were very good, "The Young Chemist" and "Loafing." Both pictures were well thought out.

Lieutenant H. A. Reed, of Fort Wadsworth, N. Y., sent an excellent exhibit of his work in "photography as applied to surveying." We fear that his work will be some time before it is appreciated. Our German cousins are far ahead of Americans in this particular branch of applied photography. But to Lieutenant Reed will fall the honor of having first called attention to its utility in the United States, and we hope that he will ultimately be rewarded in seeing the growth of interest in this direction.

G. B. Wood, the artist, of Philadelphia, as usual, had an excellent display of artistic photographic studies. Every picture had a story, and it was well told.

Henry R. Taylor, of Columbia College, New York, had an excellent exhibit of views at Newport and Niagara Falls, thoroughly well done and attractive.

Miss Margaret L. Corlies, of Philadelphia, exhibited a number of studies that were very artistic. "Wild Roses," a gentleman gathering the flowers, was

excellent. "Result of a Morning Sail," a study of fish, and "Result of an Autumn Walk," an overturned basket of chestnuts, were both very good indeed. "The Studio" also was a fine piece of interior work.

Robert S. Redfield, of Philadelphia, had a number of very pretty views, with truly artistic feeling in the selection of point of observation. Many of them had very fine cloud effects, a point often neglected.

E. B. Harden, of Philadelphia, showed some particularly fine flash-light views in the Kohinoor Colliery, a most difficult subject.

(To be continued.)

OBITUARY.

DAVID COOPER.

Mr. DAVID COOPER, whose decease we noted in the last issue of the BULLETIN, was born at Falmouth, Jamaica, W. I., in the year 1855, and was educated in the academy of that town. During his early boyhood and manhood he was engaged in sugar plantations in the West Indies, which occupied his time until the year 1873, when, wishing to change his mode of life, he entered into mercantile pursuits. In the year 1876 he came to the United States, and was for some time interested in dry plate manufacturing with Cramer & Norden. In April, 1884, he entered the service of our publishers, and, with the exception of a short period spent with the Eastman Company, remained with them until his departure in search of health last October.

Mr. Cooper was an uncommonly sociable man, free and generous in imparting information to others, and was loved by all who knew him. He had a keen eye for artistic effects, which was natural and not acquired. As is well known, he was the inventor of Cooper's Enlarging Lantern, which is now largely used by workers in bromide paper. Cooper's developer with sal soda will always be remembered as one of his practical efforts, and his manipulation of bromide paper in the production of enlargements may be equaled, but has never been excelled by other workers.

From the force of circumstances he was compelled to leave his family behind him when he returned to his native land in search of health; but we are glad to know that kind friends ministered to him during his last hours, and he passed away at 10 o'clock on the morning of April 5th last.

Those who knew him best admired him most; and there is no one who ever met him but will feel that the world has lost a good worker and photography an earnest devotee.

OUR ILLUSTRATION.

THE frontispiece of this issue of the BULLETIN gives a view of the yacht "Seneca," owned by Mr. Tribkin, of the Brooklyn Yacht Club. The negative was made by Mr. A. A. Knox, of Brooklyn, from a position at the Government Dock at Sandy Hook, New York Bay, and under the most adverse circumstances. The prints were also made by Mr. Knox, upon Anthony's Reliable Bromide Paper.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

AN OLDER CUSTOMER THAN MR. ROCKWOOD.

THE following communication received by our publishers speaks for itself :

Your BULLETIN for April received, and I read with interest the article on Mr. Rockwood, "your oldest living customer," but if the dates given are correct, he is not so. If you can refer to your books you will find I bought my first stock from you in the latter part of 1856, and have been more or less a customer continuously since that date, and I am thankful to say alive and well.

I may also say that my business relations with your firm have always been of the most pleasant and satisfactory nature, and a warm bond of friendship existed between myself and the lamented E. & H. T.

Yours very truly,

WILLIAM NOTMAN.

CORRECTION.

On page 228 of BULLETIN, line 16, "100 grains of pyroxyline" should be "10 grains," etc.

BULLETIN WANTED.

WE are very anxious to obtain copies of the BULLETIN for January 12, 1889, to complete the lists of our new subscribers ; any of our friends who have extra numbers can obtain full price for them at the office of our publishers, if they are in good condition.

THE following is a very curious puzzle: Open a book at random and select a word within the first ten lines, and within the tenth word from the end of the line. Mark the word. Now double the number of the page and multiply the sum by five. Then add twenty. Then add the number of the line you have selected. Then add five. Multiply the sum by ten. Add the number of the word in the line. From this sum subtract 250, and the remainder will indicate in the unit column the number of the word ; in the ten column the number of the line, and the remaining figures the number of the page.—*Boston Saturday Evening Gazette.*

ONE of the teachers in the Second Ward school, Alleghany, celebrated the Centennial by telling her scholars the history of Washington and then requiring them to write what they remembered of it. This is what one of the youngest scholars wrote : "G. Washington chopt with his hatchet and bust into tears."—*Pittsburgh Chronicle Telegraph.*

WHEN a rich and miserly man tells me that he is accumulating as much as possible in order to create and endow some great charitable institution in his will, I have no hope whatever that that particular institution will ever have tangible existence.—*Chicago Standard.*

WHEN a murderer confesses his crime and his attorney tries to prove him innocent—well, that's "professional."—*Detroit Tribune.*

"TALK is cheap;" but can it be considered so when it costs a man his reputation?—*Parkers Statesman.*

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—D. H. A. writes: I am troubled in having my pictures curl out of shape very much. I put them on glass to drain for a few minutes, mount with Parlor paste, pack them up as soon as they begin to curl forward, spot and burnish them as fast as possible, and if I pack and press them for two or three days, on taking one out and putting it in the show case, it will curl all out of shape. I have tried thick and thin cards, and other remedies, but with no success. Please give a remedy. I inclose a print. Is it under-timed or under-developed? Have I used too much pyro or too much alkali? What makes the shadows so black and without detail?

A.—The trouble with your prints is probably due to the fact that they are too wet when

mounted. After draining dry them by pressing out the water with clean blotting paper, and allow to dry in air until they are nearly dry but still damp; then use stiff paste and not too much of it. Your print is apparently from an under-timed negative. Give more time and don't force development.

Q.—W. B. C. writes: Will you kindly favor me by answering the following in the BULLETIN: I want to mix a developer and measure the strength by the hydrometer, as I believe that is the correct way to compound developers. How many grains to the ounce should I make the sulphite of soda solution and the carbonate of soda solution and the pyro? How much pyro will the soda solutions use in depositing the silver salts in gelatine plates acted on by light, without an overplus or waste of pyro? I understand that all over a certain amount of pyro in the soda solutions is of no value to the development of the image. Am I right or not? Can negative films be used in a glass cornered plate-holder for the taking of portraits? What effect will a decidedly acid solution of pyro have in the developer (made acid with sulphuric acid)? By answering these questions you will greatly favor me.

A.—A saturated solution of sodium sulphite or sodium carbonate should stand 24 degrees on Beaume's hydrometer. The pyro solution can be made 40 grains to the ounce (437.5 grains); then one fluid dram contains 5 grains. To this should be added about 30 grains of sodium sulphite and 20 grains of sodium carbonate to make one ounce of developer. This is a strong developer and should be reduced with water for all except instantaneous exposures. We cannot give an idea about the loss of strength of the pyro; it deteriorates much more by exposure to the air than by its action on the silver bromide. You can probably use the new negative films if you fit a piece of brass wire into the plate-holder to prevent them from springing out; but be careful to have a piece of card about the thickness of a glass plate, so that the films will be in focus. Acid solutions of pyro keep better than alkaline ones, but if you use too much acid it spoils (neutralizes) the alkali of the developer.

Q.—A. C. writes: Will you kindly answer through the BULLETIN, of which I am a subscriber, the following: I have been using a nitrate of ammonia silvering bath. It has got out of order and all I can do will not bring it back to its usual working qualities. Can you enlighten me at all on the subject, or can you give me a good formula of the nitrate am-

monia bath? The way I am using it now, I take $\frac{1}{2}$ pound of silver and $\frac{1}{2}$ pound of nitrate ammonia and put into 40 ounces of water, and when I want to strengthen the bath I add just a little of the strengthening bottle. Now what I want to know is this: when I add this to the bath it has a tendency to make the bath acid; is it proper to have an acid bath or an alkaline one?

A.—We cannot understand why your silver bath should become acid, unless the silver stock solution is acid. If the latter is acid the silver nitrate is not pure. You can use the ammonia nitrate slightly alkaline with ammonia if you choose; it works well so. A pure silver nitrate bath should be just acid to blue litmus paper, using chemically pure nitric acid for the purpose.

Q.—F. F. S. writes: Please tell me where I can obtain a prepared collodion emulsion suitable for lantern slides; also if it is possible to procure pigmented tissue for carbon printing?

A.—Write to our publishers; they can supply you with both materials.

Q.—J. McN. writes: Will you please give a formula for making permanent photographs on watch dials?

A.—A process for this purpose is described in the "Silver Sunbeam," page 308. The book is issued by our publishers; the details are too long for these columns.

Q.—E. O. T. writes: Why does my printing bath turn milky after using? There is quite a precipitate after standing, which sticks to the sides of the bottle, and a scum forms on the surface. Have treated it for albumen, but without avail. Bath 60, strong, slightly acid, float 3 minutes.

A.—In such a strong bath we would not float quite so long. The precipitate is due to silver chloride, and should be filtered out. Perhaps your paper is too strongly salted.

Q.—J. T. K. writes: I am going to rebuild my photograph gallery soon, and would like to get some information about lighting

my operating room. What color curtains would be best for top and side lights? Also, how far should the side light be from the floor and about how high ought it to be to get best results? Could you tell me the name of some material that is perfectly transparent yet at the same time will cut out all reflections, to be used on screens?

A.—In constructing a studio, we should advise you to read the papers of Mr. Duchochois, published in the BULLETIN, Nos. 22, 23, 24 of 1888, and Nos. 1, 2 and 4 of 1889. We do not know the kind of material that you mention.

Q.—W. W. writes: How soon will your "Annual" be ready for 1889? Can you get or tell me where to get the articles referred to at bottom of page 298 in 1888 BULLETIN in regard to stereo work, by Mr. Traill Taylor and Mr. W. E. Donkin? Can you recommend any cheap work on stereo photography?

A.—The "Annual" for 1889 is in the press and will be issued promptly June 1st. We do not understand the rest of your question; please repeat, and give number of page and date correctly.

Views Caught with the Drop Shutter.

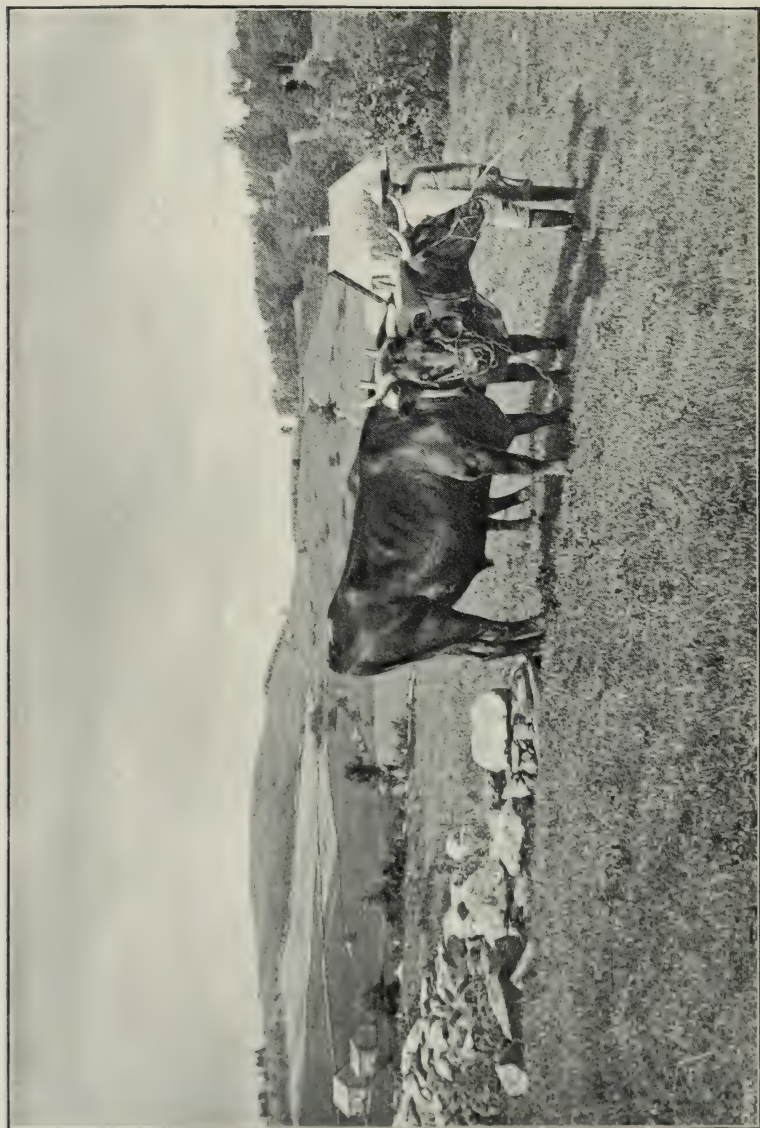
MILLER & HOPKINS, of Brooklyn, have started a new store for photographic supplies at 4 East 60th street, New York.

Messrs. A. G. SPALDING & BROS., the celebrated sporting goods house, have added to their already large and assorted stock a line of photographic apparatus and materials. The well known enterprise of this firm assures for them as great success in this line as they have achieved heretofore in others.

MORRIS EARLE & COMPANY will continue the business lately conducted by W. H. Walmsley at 1016 Chestnut street, Philadelphia.

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NEGATIVE BY
HAYWARD S. COZZENS.

CLEARING THE FIELD.

Franconia Mountains, near Sugar Hill, New Hampshire.

MADE WITH
E. A. WIDE ANGLE LENS.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

MAY 25, 1889.

Vol. XX.—No. 10.

THE DRIFT OF AMATEUR PHOTOGRAPHY.

IN looking back over the results of amateur photographic work during the past four or five years, we cannot help thinking that an immense amount of time and material have been used up in finding the true scope and field for this development of our art. Yet we believe all this labor and material have been necessary to bring into existence a class of workers who are destined to have a very important effect upon the future of photography. These amateurs have had a most important influence upon every department of industry that has for its aim the supply of the materials and apparatus designed to facilitate photographic progress.

In former years the camera and its appurtenances were clumsy affairs, seemingly designed to furnish the amateur photographer with a complicated system of mechanical devices that required a course of instruction in machinery in order to manipulate them with any degree of certainty. To-day the camera box is much simpler, and the better class of instruments are so constructed that the minimum amount of intelligence only is needed to use them. Dry plates and printing papers are now so well made and so easily manipulated that almost any one can obtain negatives and positives without any very large expenditure of brain power or time.

With the simplification of methods has come an increase in the numbers of those who practice photography as an amusement or hobby. As a collateral to this increase in the number of workers, we have had to witness a large amount of aimless work. Of any given number of amateur workers, how few there are who use the art with any definite object in view. Thousands of negatives are taken every week, and among them how few can be called pictures, how few have any story to tell or any important object to carry down into the future! It is true there is a tendency in certain quarters, among a few of the societies, to give a direction to this kind of work; and we hail with joy this first evidence of a desire to give photography a standing among the arts that shall make it valuable to mankind.

There are hundreds of ways in which our beautiful art can be made to serve as a helpmate and handmaiden to the other arts and sciences. It is not

our purpose to give a catalogue of these, but a few suggest themselves. The study of various trades and industries peculiar to this age, by making good pictures of the workers at their tasks, would give a series of records that may go down to the future with profit, and as the years roll by their value will become enhanced according to the care and faithfulness with which the camera shall secure them. The incidents of our home life, the dinner table and those around it, the library, the parlor, and, more interesting than all, the children at home and at school, would all give pictures that those who come after us will value more than we do. For it is too true that in the development of this great country little regard has been paid to old things, and only now we are beginning to realize that they have their value.

In the sciences also there is a vast amount of good work to do. The botanist needs better photographs of flowers and trees and shrubs, which, by the use of orthochromatic plates, can now be obtained far more faithful to nature than heretofore, the ordinary dry plate giving results that are positively untruthful to nature in the matter of lights and shades. The zoölogist also has much need of good pictures of the animals, birds and fishes in his museums, and also those that are seen in their native haunts. What better work could an amateur photographer set for a task than a record of many of our beautiful flowers, especially the wild ones that cover our hillsides and woods in the early spring? What better and more interesting work could be found for his camera and dry plates than the pictures of our fishes fresh from their native element? Indeed, under certain circumstances the fish could be caught with the camera as he suns himself in the crystal stream. Birds and their nests, butterflies, moths and other insects, curious and interesting to all who love nature, could each be made a *motif* for amateur photographic work.

Again, we need not confine our attention to animated nature. Look upon the hills, the rocky cliffs, the stratified escarpments that are to be seen in rambling through almost any section of the country. These all have some story to tell for the geologist and would be admirable subjects for the camera.

The historian also needs many pictures for his records that photography, and photography alone, is fully competent to make for him. These pictures will be faithfully presented, and are not likely to be distorted as by the pencil or brush in human hands. Old homesteads, old landmarks, old houses that soon pass away in the tendency for modern improvements, should all be secured upon the photographic plate.

But we have said enough suggestive of subjects for the amateur's camera. We are sure hundreds of others will present themselves to those who are looking for an aim or drift for their photographic work. We are glad to notice this tendency of amateur workers, this desire to use our art with the object of making it tell upon the records of the country's history. The very beautiful series of pictures illustrating our great cities, first inaugurated by the Boston Camera Club, is a step in this direction. We hear also of the work of photographing our native trees in classes, which was begun by Dr. N. L. Britton, of Columbia College, several years ago.

Altogether there is a strong feeling among amateurs that they must specialize their work. The time has come when the recruiting of their ranks is not so much an object as the direction of the labors of the good workers among them. The recruits are no longer raw, but most of them are fitted to accomplish work

that shall tell in the development of photography, and at the same time place it upon a better footing among the sciences.

EDITORIAL NOTES.

MR. HORACE W. GRIDLEY, of New York, has again been awarded a medal at the Crystal Palace exhibition. This award is a bronze medal for his architectural studies, which are pronounced "very fine." We must congratulate Mr. Gridley on his continued success in our art, and hope he will live many years to receive the laurels that always fall upon such earnest devotees to artistic photography.

IN our recent notice of the picture of the total eclipse of the sun, kindly sent by Professor W. H. Pickering, we inadvertently gave the credit to his brother, Professor E. C. Pickering. Professor W. H. Pickering is the one that did the work, and to whom the honor is due. When two brothers are doing such glorious work in photography and its application to astronomy, it is not always easy to remember to whom the latest achievement is to be credited.

WE regret to note that Messrs. Queen & Co., of Philadelphia, have had to issue the following notice :

"Owing to the continued illness of Mr. Joseph J. Fox, the managing editor of *Science of Photography*, we have decided to discontinue its publication. As the March number will be the last issued, we shall be pleased at once to make good to subscribers, whose terms of subscription have not expired, our indebtedness to them."

The new journal was doing excellent work for our art, and the shortness of its career is a decided loss to photographic literature.

WE note the formation of the University Camera Club at the University of Pennsylvania. The officers are : *President*, D. Fuguet ; *First Vice-President*, J. E. Carbutt ; *Second Vice-President*, P. E. Howard ; *Corresponding Secretary*, G. H. Hill ; *Recording Secretary*, H. Delaplaine ; *Treasurer*, J. M. Mitcheson.

MR. R. L. STEVENS, of the Louisville Camera Club, sends us the following items in regard to his Society :

"We are connected with the Polytechnic Society of Louisville, and as members are entitled to all the privileges of the Society, including the laboratory and hall for our public exhibitions. We have two fine rooms in the Polytechnic Building, including dark room, and being in the central portion of the city, it is very convenient for the members.

"Our Club is a member of the American Lantern Slide Interchange, receiving slides monthly, and we have private exhibitions each month and public every two months during the fall and winter. These have created a great deal of interest, many local slides being added, and our audiences often number over three hundred of the best people in the city. We have arranged for quite a series of outings for the next few months, and expect to receive many new members between now and the winter months."

Our Louisville readers that are not members of this Club, should look into its advantages ; we are convinced they are many.

THE Lynn Camera Club has adopted a new and unique seal. It consists of a picture of the ground glass of a camera, with two inverted figures of amateurs taking views of each other, just as they would be seen upon a focusing screen in practice. The idea is an original one and makes a very effective design.

OUR good friend, Dr. Edward L. Wilson, who was ordered by his physician to stop work, has been rusticated at Littleton, N. H., where he has regained his strength, and returns to his desk in New York with renewed energies. We are glad he has recovered, and hope for many good things from his pen in the future.

THE Society of Amateur Photographers of New York are organizing a special public exhibition of their work done during the Centennial. This will be in the form of a lantern exhibit, and trial nights for slides of members have already shown that a goodly display may be expected. The date of the exhibition is May 28th, at Chickering Hall, at 8 P.M.

WE are indebted to the Cincinnati Camera Club for a very handsome pamphlet of its Constitution and By-laws, and list of members. It also contains the Constitution of the American Lantern Slide Interchange. It is very neatly printed, and the illustrated cover makes a pretty design. We tender our thanks to the Club for its kind remembrance.

As we go to press the "International Annual" comes from the binder and will be ready for subscribers by June 1st. It is well up to the former volume and in some instances it surpasses it.

THE PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.

BY ONE OF THE CROWD.

To any one who is partial to the iron horse, commend me to the London, Chatham and Dover Railroad. It is by this route, unhappily, that many persons who wish to reach the Palace are forced to travel. A third-class smoking carriage should be selected by preference (*sic*), when the sensation experienced is novel, not to say exhilarating. Of course on this particular line, one hardly expects to have cushioned seats in the third-class, seeing that bare boards only are provided. Nor does the company provide automatic brakes. Therefore, as the row of extemporized cattle trucks, as they are often familiarly termed, stroll leisurely up to each station, the grating of the guard's hand brake imparts a peculiar vibratory motion to the car as though it were about to leave the metals. All this is decidedly beneficial for the purpose of enabling highly nervous photographers to become inured to this luxurious form of modern traveling.

After an unprecedented run of something less than an hour from Moorgate street (City), in which about nine miles are traversed and over a dozen stations stopped at, the Crystal Palace is at length reached. The turnstiles are passed at last, when Heigh! Presto! what do we see? From one end to another the vast edifice—a colossal, overgrown green-house is a good name for it—has become temporarily converted into a huge photographic depot. Some people have a notion that the Britisher is not good at big things. Perhaps this remarkable display will undeceive them. It literally beats the record as far as photography goes.

The exhibition has been instituted, so we are informed, for the purpose of celebrating the jubilee of the art science. The first photographic negative we learn was taken in the year 1839, and was made known by Mr. Fox-Talbot in a communication to the Royal Society of that year.

If some of our older workers of less than fifty years ago who have gone "over to the majority" could be resuscitated by the spirit-rapping fraternity, or by other means, to view this show, one would be almost inclined to think that they would feel somewhat bewildered at the endless array of cameras, shutters, dry plates, etc., here set forth. Perhaps under all circumstances, if some kindly and philanthropically disposed reporter were to interview their spirits, they might be inclined to stay in their present quarters, giving it as an excuse that their constitutions were scarcely fitted to withstand the jargon connected with positively the latest developer, the newest camera patent, or the best dry plate or shutter.

Roughly speaking, the exhibition is divided into two parts, viz., the art division, and the portion devoted to apparatus. Let us first direct our attention to the last named. The first thing that strikes an outsider is the enormous amount of competition and emulation that is witnessed among dealers and manufacturers. This is especially the case with regard either to very large or very small cameras. If one firm bring out a camera of more than the usual dimensions, another will shortly introduce a still larger one with all his own pet so-called modern improvements and patents. What one would like to know, is the good of these unwieldy articles except in the studios of the very few operators who cater for aristocratic clients. The amateur does not want these bulky machines, for he now enlarges. So also do a large number of professionals.

The majority of professional operators, whom we see dotted about all over London and the provinces, would feel hurt if anything larger than a panel was suggested. While the despised though useful itinerant, with his dark room on wheels, who will take your tin-type for twenty-five cents or give you a dozen *carte de visite* at the rate of less than a dollar, in which the sitter appears either to be in a rapid consumption, or else in a fog—probably both—would vote you down as "trying to get at him."

With small cameras, however, the case is different. The rage now is for lightness, concealment and simplicity of manipulation. Associated, as it is, with an inordinate desire to take everybody and everything, one can quite understand in these days of simplified enlarging and perfect bromide papers that a detective or hand camera is most useful. This particular outcome of the manufacturer's art, therefore, is likely to be still further perfected and brought into general use as time goes on. The recent introduction of the Kodak by the Eastman Company has stimulated manufacturers on all sides to improve and perfect their small portable hand or detective cameras, as this exhibition well testifies. A beautiful piece of apparatus of this kind is Shew's Eclipse, as is also Anthony's improvement, The Lilliput (a specimen of which I do not think was on exhibit).

Mr. A. R. Dresser exemplifies what splendid work can be done in this direction by means of these hand cameras. He exhibits in the art division a series of small prints about $1\frac{1}{2} \times 1$ inch, which are enlarged up to about 12×10 . The subject is entitled, "A Study of a Dog After a Stick." The animal, being made to run into the water after a stick, was taken in various positions, many of which are very striking.

I need not weary the readers of this journal with a detailed description of all the wonderful and varied pieces of apparatus, etc., found at the Palace. There is, however, one novelty which is perhaps destined before long to revolutionize the present dry plate system, should it come generally into use or prove practicable; that is, Dr. Backelandt's dry plates, which are developed merely by water. When these come into regular use many of our literary friends will hardly know what to write about unless they give forth to an admiring public elaborate formulas for *aqua pura*. What with dry plates developed with water and platinum paper developed merely with a weak hydrochloric acid wash, the manipulating tourist who develops his plates in his bed-room and mails specimen prints to his friends is soon likely to have a good all-round time of it.

As to the art division, when it is considered that upwards of 1,200 photographs are on view here, many, if not all, being perfect gems of what an ideal photograph should be, it will be realized that the artist interested in the art side of photography can, metaphorically speaking, feast himself to satiation. To an onlooker the decision of the judges is rather perplexing. The only gold medal is given to Mr. Lavender, of Bromley. His exhibit consists entirely of portraits. Although his pictures are undoubtedly very perfect, still, when comparisons are made, one greatly wonders why other competitors did not equally take a gold medal. Verily the ways of judges are not to be accounted for. Many of the landscapes are exceedingly artistic. A beautiful view of Loch Lomond in sepia is especially striking. It is executed by G. W. Wilson & Co., who receive a bronze medal for Loch Achray and Peterhead Harbor, both of which are very good, but to my thinking do not come up to the first mentioned.

A real picture by Mr. Cembrano, of Richmond, is "At Sunrise." Strictly speaking, I suppose, it is under-exposed, but the effect produced from an artistic point of view can hardly be equaled.

Mr. Gridley, of New York, exhibits a number of very fine architectural studies, for which he has been adjudged a bronze medal.

Sepia tones seem to be coming more into vogue, and many of the best pictures are executed in that tint.

Prints of lightning flashes are getting quite common since Dr. Piffard (I fancy he first originated this) led the way, and several very good specimens are exhibited by Negretti and Zambra at their stall.

It would, of course, be impossible to enter fully into details of the numberless exhibits in this beautiful array of picked photographs. I am afraid I have already sufficiently wearied the readers of the BULLETIN.

A special feature of the exhibition is the lantern slide entertainments, from which those who are partial to this kind of work may get many useful hints. A special lime-light apparatus is used and the pictures thrown onto a screen 30 feet in diameter. With good slides the effect is most striking, for under existing circumstances they are seen in their best. Mr. T. C. Hepworth, the well known author of "The Book of the Lantern," described the views. These entertainments seem to be decidedly popular, and are much frequented by the public at large.

That much is to be learnt from exhibitions of this kind can hardly be denied, and that it stimulates exhibitors to put forth their best efforts is no doubt equally true.

EDWARD ANTHONY'S EARLY PHOTOGRAPHY.

In the notice of Mr. Edward Anthony's life which was published in several of the photographic journals, there was a misstatement of fact which, though perhaps not important, might lead to misunderstanding. Mr. Anthony became interested in the daguerreotype when the details of the process were first published. He made a camera, and, if I remember rightly, had to prepare most of the chemicals. In fact, the whole of the apparatus was of his own construction. His success was great, as is shown by many samples of his work which were made at that time and which are still in existence.

About this time the question of the Northeastern boundary of the United States was in question. Not the Northwestern, as the accounts we have mentioned state. It was in regard to the interpretation of the treaty which located the boundary between the State of Maine and Canada. The line was located by the terms of the treaty along the highlands which divided the water-sheds, the St. John, Penobscot and the rivers flowing into the St. Lawrence. The dispute at last turned upon a question of fact in regard to the highlands. It was held by the English government that there were none at the place claimed. When the surveying party was fitted out Mr. Anthony determined to take his camera along with him, and bring back if possible visible proofs of the highlands, if any were found. In speaking of it a few years ago he said to the writer that this happened before the tripod, as applied to cameras, had been invented. When the wilderness was reached he set his instrument up on stumps, logs or stones, as happened to be convenient, and so made his exposures. The highlands were found. Pictures were made in which they were shown and these daguerreotypes were duly transmitted to Washington. Probably they might be found among the records if search was to be made. These, Mr. Anthony said, with some pardonable satisfaction, were the first sun pictures—photographs—ever obtained by a scientific government expedition. It may be assumed that this was the first practical scientific use of the art that had ever been made. In the accounts just mentioned it is stated that the pictures were photographs made by the wet process. Photography by the "wet process" had not then been invented, and even the process of Talbot, we think, had not been made public; at least, at the time when Mr. Anthony started on the surveying expedition there was but one process of making pictures by means of the camera.

The difficulties of making daguerreotypes in such a wilderness can hardly be appreciated at the present day. The art itself was in its infancy. There were no teachers for beginners, and all that was known was from the scanty accounts which had been published a year or two before. The country in which the work was done was very wild, and all the apparatus had to be transported long distances upon boats and probably part of the way had to be "packed" by the members of the expedition upon their own backs for want of other means for transportation.

It is impossible for the younger men in the profession to realize that a man has lived so recently who began at the very beginning of the photographic art. Its more recent developments seem like the outgrowth of generations of investigators, rather than the work of half a century.

SKIT.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

LIGHT SOURCES FOR PROJECTION APPARATUS.

BY F. STOLZE.

It is an old question, but not definitely answered yet, which may be considered as the best light source for the projection apparatus; and this question has gained a particular importance lately in that the magnesium light competes with all the light sources heretofore in use, and in the improvement of the material and apparatus applied for burning it. Under these circumstances, it may be of importance to determine for which purposes and in what cases the several light sources at our disposal are the most suitable.

The question becomes somewhat complicated, as not only glass positives for the purpose of viewing with the eye are projected, but also negatives, developing the projected picture from a positive surface, and thus producing a direct enlargement. In the latter case it is indifferent whether the light source is a constant burning one or whether it is intermittent and flickering, the only consideration being that the total light intensity is the same. For observations with the eye steadiness of the light is the very first condition, and whose absence will exclude any success. On the other hand, the color of the light is for the eye of no consequence, as long as it remains within the usual limits for artificial illumination, while it is of the greatest importance for the photographic reproduction. Finally, the question of transportation has to be considered, as the application of many light sources, which otherwise are excellent, is excluded on account of this. Following these directions, I will try to speak about the principal light sources, namely:

1. Electric light.
2. Magnesium light.
3. Kerosene light.
4. Gaslight.
5. Oxygen light.

I. ELECTRIC LIGHT.

At any place where, produced by dynamo machines, the electric light is at our disposal, it is not only the most convenient, but also the cheapest. Its constant illuminating quality has to be particularly considered for application to positive projections. The circumstance that illumination can reach easily 1,000 to 2,000 candles, and that the light source emanates from one point, makes it particularly suitable for the working with condensers. It is also very agreeable that it can easily be regulated, interrupted and colored by the material of the carbon rods. One evil, of course, has to be accepted with the bargain: the sudden flickering which takes place sometimes, caused by unevenness of the carbon or breaking off of the same, and which is unavoidable. Finally, if the motor setting the dynamo machine in motion is not of perfectly even movement, the light will be defective for positive projection; but for negative projection it will be just as useful as a completely constant light. Where electric light cannot easily be obtained, an extended use would only warrant its application and be of benefit. For houses doing a large business in enlargements the electric light would be of advantage, even if motor and dynamo have to be purchased. For a smaller business other light sources would be more preferable. For posi-

tive projective purposes, where the party travels from town to town, the electric light might just as well be excluded.

II. MAGNESIUM LIGHT.

For positive projection magnesium ribbon only, and not magnesium powder, can come into consideration, while for negative projection both are applicable. In all cases, of course, precautionary measures have to be taken for letting the smoke out. Dr. Meydenbauer's publication in the *Wochenblatt*, page 353-356, describes how to do it with the magnesium ribbon. Another question is, how the same purpose can be attained with magnesium powder. I would like to draw attention here to a method which has already been applied, but not in the manner that I would like to propose. Magnesium flash-light has been produced in a closed space, so that it will act through glass; proofs for this are Gädicke's flash-light box and Meydenbauer's flash cylinder. But to the extended application of this method is opposed the explosive power of the magnesium flash powder, which requires particular caution, as the glass sides, enclosing the powder, may not only be easily broken, but they are also clouded. If in place of this pure magnesium powder is blown vertically upward through the flame of an Argand burner, enclosed by a Meydenbauer flash-light cylinder (not necessary to be wound around with wire), the fumes of the magnesium will remain enclosed, while a magnificent flame is obtained. As in this manner the burning magnesium particles cannot be forced against the glass sides, the latter can easily be cleaned. I am well aware of Professor Schirm's assertion, that pure magnesium powder is consumed without smoke; this, however, is the case of very small quantities only, where the smoke may be disregarded. Larger quantities require by all means the removal of the smoky oxidation product, which appears even in greater volume than with an equal quantity of magnesium ribbon.

So far about the flash-light. As soon as the magnesium ribbon, the only thing that is fit for positive projection, is under consideration, the other style of magnesium lamps is not very suitable for this purpose; the uncertainty of removing the smoke, the flickering of the flame, burning at intervals darker or brighter, cause the light to be unsteady to a high degree. But the new manner of smoke consumption by Dr. Meydenbauer, together with the steadiness of the light center obtained by regulation, offers in return the means to remedy these defects and reduces the fluctuation of the strength of light. If we go now one step further and ignite two or three ribbons in close proximity in a correspondingly constructed lamp, whose fluctuations will never be uniform, their influence will be very insignificant, and can hardly be greater than the one mentioned before with the electric light. It is, therefore, very possible to give also lantern slide exhibitions with magnesium light, although it has to be admitted that in other ways a handsomer, because more uniform, light can be produced for the same.

III. KEROSENE LIGHT.

That kerosene light can be used to advantage for positive projections on a small scale is known, and also that it suffices completely for enlargements on sensitive preparations. In the latter case it deserves even oftentimes the advantage over the magnesium light, because it admits, on account of its, chemically, much less active color, by prolongation of the exposure, a better gradation of the

tones and easier retarding of some parts of the picture. Otherwise the convenience of its manipulation, its cheapness, transportation, and the possibility to get the material at any place, rank it first among all lights, the same as electric light surpasses all others in regard to strength.

IV. GASLIGHT.

Very nearly related to kerosene light, but capable of greater modification, is gaslight, which, of course, is only applicable where gas can be obtained. It divides in many ways its good properties with the former, which are even increased in many respects. The intensity of the gaslight can be increased considerably with the regenerative burners, and if it was possible to apply the later forms of the same, like those of Wenham and his successors, in horizontal instead of vertical position, a better light source for positive projection could hardly be thought of, as long as the highest intensity, as furnished by electric light, is not required. For negative projection the yellow color of these light sources has always to be considered. To be sure, the gaslight shows here also its universality. As alcoh-carbon light it approaches already by its white color the chemically more effective light sources, and in Auer's glow-light it comes very near to them. If, in place of the condensing lens, the Meydenbauer mirror-reflector is applied, one is enabled to unite a larger number of burners behind the ground glass, thus increasing greatly the light power. Of course there is still a want of thorough tests of this kind ; but it is worth trial to bring into service this extremely convenient means of illumination for the art of projection.

V. OXYGEN LIGHT.

By its complete steadiness, connected with great light-intensity and facility of transportation, the oxygen light will be for some time to come the most suitable for positive projection. It must be admitted that the production and transportation of oxygen has its great inconveniences and even dangers ; but oxygen can be obtained in cylinders, and this could just as well be the case with hydrogen. Suitable pressure regulators are therefore only required to apply both gases direct from the cylinders without filling first the rubber bags. Where gas is at service this is most generally chosen, and where this cannot be had, other combinations—as, for instance, alcohol-oxygen light—are brought into use. The latter being far behind the oxy-hydrogen light, efforts have been made in England and in the United States to find an equal substitute, and this has been discovered in the ether-oxygen light, which I will describe here somewhat more clearly.

The place of the hydrogen gases is represented here by an oxygen stream saturated with vapors of ether, and the apparatus is otherwise handled like that of the oxy-hydrogen gases, both faucets being regulated until the pure oxygen faucet supplies the mixture with the satisfactory quality of oxygen for complete consumption. This seems to be extremely simple, and it would be so if the mixture of oxygen and ether-gas was not explosive in the highest degree. Several serious accidents have taken place in England on account of this circumstance, and the ether-oxygen light, which has been condemned also by the celebrated chemist, Professor Roscoe, gained for some time such a bad reputation that it was hardly ever supplied. But its great advantages, which could not be replaced by anything else, did not leave the scientists at rest, and particularly Hardwich, who not only discovered sufficient means of safety in case an explosion should take place, but he proved also that by a correct manipula-

tion of the ether-oxygen light an explosion could not take place, and that the danger of explosion is in no way greater than with the ordinary oxy-hydrogen gaslight. It depends, namely, upon the oxygen being actually completely saturated with the vapors of the ether; only when so little, or such aqueous, ether is present in the saturator, that the volume of ether vapor sinks to less than one-half of its normal state, then an explosion can take place. An accident is therefore only possible with great negligence. In England the most different forms of saturating boxes have been tried. In one of the best a spiral spring is between two porous, soaking layers of material, so that the gas is forced to make the long spiral way between the layers soaked with ether, and which before each employment and after complete drying are fed anew, in such a manner that new ether, in proportion to the quantity consumed, is distributed from a reservoir. By drying the oxygen with chloride of calcium or sulphuric acid before its entrance into the saturator, and keeping a little chloride of calcium in the stock bottle of ether to free the same from water, protection is had against any possible danger. But even if defective saturation should take place by carelessness or chance, an accident is impossible, if a pumice stone safety pipe, tested thoroughly with explosive mixtures as recommended by Hardwich, is inserted between saturator and burner. It is clear that otherwise the kind of saturator may be different; as, for instance, in a construction recommended by Ives, the oxygen passes directly over the liquid layer and is detained in its course only by several partitions. In the latter case the liberating of the ether from water by quicklime may take place directly in the saturating dish, and a kind of ether pipe may be arranged, by which one can observe from the outside if a sufficient quantity of the same is always on hand. Generally a liter is considered sufficient for an exhibition lasting several hours. Considering the incandescent body itself, lime is still principally applied for the same, but the bursting of the lime cylinders necessitates always a turning of the same after some time. Otherwise magnesium light has also been applied in place of the calcium light, and the production of the magnesium sticks, necessary for the same, has been described in the *Wochenblatt*. Lately the Zircon light has been brought into use; zirconia, pressed solidly into a platinum capsule, being used as the incandescent body. This has proved to work excellently, necessitating only to press any of the earth, that broke off, tightly into the capsule. The light, of course, is not quite as white as calcium—and particularly also magnesium—light; but it is sufficient even for negative projection. Before I conclude I would call attention to the fact that all kinds of oxygen light, with the sole exception of the alcohol-oxygen light, are dangerous, if they are worked without sufficient care and knowledge. It may happen that by defective manipulation of the weights upon the gas bags oxygen will enter the coal-gas bag or vice versa, and that fearful explosions take place in that manner. Sometimes this takes place by filling of the not quite empty bags by changing of the same and the pumice stone. Safety pipes should always be applied and everybody not being acquainted with its dangers should keep his fingers from the oxygen light.

META-BISULPHITE.

BY DR. JOHN H. JANEWAY, U. S. ARMY.

SOME months ago I began a series of experiments to determine satisfactorily to myself whether the claims made for the meta-bisulphite of potash, as a perfect

preservative for pyrogallic acid in solution with other alkaline salts usually composing a developer, were well founded or not. The article which I obtained after considerable difficulty, and which was and is now used in my experiments, it is but fair to state, is a compound of acid of bisulphite and meta-bisulphite, the latter being in excess. The developer used was Ripley's pyro-potash without the citric acid. Several solutions were made in the proportions of 1 meta-bisulphite to 1 of pyro, 1 of meta to 2 of pyro, 1 of meta to $2\frac{1}{2}$ of pyro (by weight), and so on. Immediately upon the solution of the meta-bisulphite in the pyro and sulphite solution of the developer, the solution assumed a light straw color and has maintained that color to the present time, though some of the bottles have not been unstopped, and others freely used from, and all exposed to various changes of light and temperature (34 to 78 degrees). So far its claims, as a very good preservative of pyro in solution have in my hands been maintained. In the proportion of 1 to 1 of meta-bisulphite and pyro it was found to be a very powerful retarding agent, and oftentimes rendered development very tedious. In 1 to 2 of pyro it also exerted a strong retarding action at first. Finally the proportion of 1 to $2\frac{1}{2}$ of pyro was settled upon, and though apparently a retarding influence was at first noticed, the developer soon became very energetic, and the development was concluded in about the usual time. The addition of the potash solution to the pyro and meta-bisulphite to complete the developer, changed the latter from a light straw color to a bright ruby. After developing from four to six plates in the same developer, a pellicle frequently formed upon it, and it appeared to become cloudy and slow. Do not on this account throw it away; but put it into a glass-stoppered bottle, and you will find it the next day clear, and a very valuable developer to use on an over-exposed plate, or to begin on a plate, the amount of exposure of which you are uncertain. This developer has not as yet stained any plate in my hands, though I have frequently pressed the development much longer than I have dared to do before. The resultant negatives, as a rule, are of a warm brown color, and are quick printers. It is, I think, decidedly advisable to continue the use of the sulphite of soda in the developer, and at the same time dispense with the various acids and also the bromides. Should an over-exposed plate suddenly flash out, remove it at once to a tray of water and watch the development as it proceeds. When it ceases, return it to the developer and obtain all the density you require without trouble. An accident revealed to me another result of the addition of the meta-bisulphite to the developer, much to my surprise and gratification; one that removes the reproach so often thrown on pyro. In endeavoring to save a plate from an upsetting and falling tray, my hands were covered by the developer and my linen cuffs bountifully sprinkled. (Mental remark: "Cuffs gone up, and beautiful hands to-morrow.") But the hands presented no stains on the morrow, neither did the next week's wash show any ruined cuffs. I then immersed a linen cuff more than one-half in the developer, letting it remain there between three and four minutes, removed and dried it. It was superbly stained. Some hours after I soaked it in water for one hour, when almost all the stain had disappeared. Not having any boiling water at hand, consigned it to the weekly wash, and it was returned to me without a stain or blemish. Generally developing after 3 P.M., and having no longer any apprehension of stained hands or dirty finger-nails, I freely plunge my fingers into the developing tray, to remove the plate for examination, or final abstraction, resting assured that the morrow will find no stains.

[Written for "International Annual." Too late for Insertion.]

OUT-OF-DOOR PHOTOGRAPHY.

BY SAMUEL SIMS, *England.*

BYRON writes, in "Childe Harold's Pilgrimage" :

"There is a pleasure in the pathless woods,
There is a rapture on the lonely shore,
There is society where none intrudes,
By the deep sea, and music in its roar."

If this be true, then the amateur hath his reward, for much of his time is spent in places such as the poet describes.

The amateur is a free lance, and he has this great advantage: he can generally choose his own subject, and the work done, is the outcome of his own individuality and taste.

A great deal has been said as to the relation of photography to art and the sciences. What is its position in regard to history and the past? As persons are fond of history, localities associated with historical events will have an attraction for them. So with regard to great names in literature. How many thousands, year after year, visit the scene of Shakespeare's birthplace, Stratford-on-Avon? In my outings I first find out what objects of interest are in the neighborhood. This not only saves time, but it gives a charm and directness to the work. Research will often reveal interesting facts connected with the neighborhood. Many old county families are now living in the same place their ancestors lived in centuries ago. This is readily seen, in looking up the history of the manor, or the old manor hall, and in the ecclesiastical records of the village church. The village church, with its curious gargoyles, "the little wide-mouthed heads upon the spouts," and ivied tower, makes an attractive picture. But study its history, and connect that in some way with the work you are doing, and you add greatly to its value. The English manor hall has been described in the pages of many of our great novelists, and "Bracebridge Hall" shows that it had an equal charm to Washington Irving. Like the village church, it is typical of English country life.

Last summer I went to a little village called Croxall, about six miles from Burton-on-Trent. Not far from Croxall is Catton Hall, and in the same neighborhood is a place called Dryden's Walk. The biographers of Dryden tell the story of his walk home one night from Will's coffee-house, when he was waylaid and cudgeled by three hired ruffians, but as far as I know they had not related how his name got associated with this part of the country. It was this circumstance that prompted me to visit the neighborhood and try to unravel the mystery. A pleasant road to Croxall is through Drakeler Park, where a fine herd of deer is kept, and you also pass through the pretty village of Walton-on-Trent. But as I had a whole plate camera to carry, I preferred the Midland Railway.

The road on leaving the station crosses the River Mease. The country is mostly level and intersected with many watercourses marked by straggling rows of willow trees. You pass some stately elms, in which a numerous colony of rooks have made their nests, and there before you is the old manor hall. It is a dark brick mansion covered with ivy, with a row of yew trees on each side of the lawn. A photograph was taken of the scene, but the most interesting feature of the old hall is not shown—namely, its past history.

The Curzons had their home here for many generations. They came in with the Conqueror. A Richard de Curzon held four knight's fees in the County of Derby, and Croxall was one.

The Saxons had to submit to the

"Good old rule, the simple plan,
That they should take who had the power,
And they should keep who can."

The Curzons held possession of the manor up to nearly the middle of the seventeenth century, when Mary, the only representative and heiress of that family, was married to Edward Sackville, Earl of Dorset. Lord Clarendon relates that this same Edward Sackville fought a duel with Lord Bruce under the walls of Antwerp. Bruce was killed, and Sackville, who was wounded, sought shelter in a neighboring monastery.

The Dorsets held the manor up to near the end of last century, when it was sold to Thomas Prinsep, Esq., in whose family it now remains. There is a road through the private grounds to the church, as is the case with so many English manor houses. The church contains chancel, nave and low western tower, in which there is a curious shaped bell said to be mentioned in an inventory of Edward III. The taxation roll of 1291 gave the value of the rectory as £10, 134. There are many old brasses and incised slabs to the memory of the Curzon and Horton families. A Roger Horton died in 1422 "seized" of the manor of Catton. He is supposed to have been the first of that family who settled in this part of the country. There is a memorial to the last of the Curzons, and a few yards distant one to the last male representative of the Hortons. In the chancel are several incised slabs with figures of them in armor. In the middle ages the pictures seen from the old hall were like those which passed before the Lady of Shalott as described by Tennyson:

"Sometimes a troop of damsels glad,
An abbot or an ambling pad,
Sometimes a curly shepherd lad,
Or long-haired page in crimson clad
Goes by to towered Camelot;
And sometimes through the mirror blue
The knights come riding two and two:
She hath no loyal knight and true,
The Lady of Shalott."

Near the church, at a bend of the River Mease, is an ancient tumulus and remains of earthworks, supposed to have been thrown up to keep back the Danes who came up the river in their small boats. The way to Dryden's Walk is through a wicket gate near the rectory, and it follows the crest of the hill which looks down on the park and the valley of the Trent.

Dryden's visits were made when the Dorsets held the manor. He dedicated the translation of "Juvenal" to Charles, Earl of Dorset, in 1692. A copy of the 1735 edition is now before me, with a portrait of Dorset in the long, flowing wig of that period. It is likely that some part of that work was pondered over in his walks over the crest of the hill which now bears his name.

The poet Prior relates that when Dryden's pension was stopped on account of his change of religion, Dorset allowed him an equivalent out of his own pocket. Dorset is said to have been one of the most accomplished men at the courts of Charles II. and William III. He served as a volunteer in the fleet in

the Dutch War, and on the night previous to the fight in which the Dutch Admiral's ship was blown up, is said to have written the famous song :

“ To all you ladies now at land
We men at sea indite,
But first should have you understand
How hard it is to write;
The muses now, and Neptune too,
We must implore to write to you.”

* * * * *

The last verse of the song seems to imply that all the men were not at sea and that the latter was not always calm :

“ Let's hear of no inconstancy,
We have enough of that at sea.”

Catton Hall, the home of the Hortons, is a stately brick mansion near the River Trent.

PHILADELPHIA EXHIBITION.

(Continued.)

MR. JAMES L. DILLON, of the Philadelphia Society, had an excellent series of studies. “ This Little Pig Went to Market ” was a gem, the idea, the picture of the lady with child and the general artistic effect of the photograph, being of the highest order. Another gem of this collection was a flash-light picture of a laughing baby standing by a pedestal with a statuette on it, and entitled “ The Art Connoisseur. ” Another and somewhat humorous picture had the title, “ Where are Those Women ? ” a group of three gentlemen with four babies in their arms; they certainly looked bored and as if they had mistaken their occupations.

Mr. Alfred Clements, of the Philadelphia Amateur Photographic Club, had a beautiful collection of platinotypes, some the usual dark gray and black tones, some sepia toned, but all gems of artistic photography and every one a study of the picturesque in landscape work !

Dr. Charles L. Mitchell, of the Philadelphia Society, had a number of studies that were very fine pieces of photographic work and many of them very beautiful as pictures; but we must confess that in quite a number of cases the prints were so dark that in this respect the beauty of the pictures was marred. We cannot leave the exhibit without noting one gem, “ Cascade on Beecher's Brook, Crawford, N. H. ” It was a beautiful bit of nature, thoroughly well caught.

John Bartlett, of Philadelphia—well, we are at a loss what to say about this exhibit. The artistic feeling in every picture, the evidence of thought in the selection of the subjects and the extremely careful manner in which they are presented always commands our admiration in the work of this exhibitor. It is useless to go into details; the whole exhibit was a fine one. Those that pleased us best, perhaps, were “ Fresh Oysters, ” “ Learning to Read, ” “ Twenty Days to Whitsuntide ” and “ Old-time Market ”—all of which must be seen to be appreciated, every picture being worthy of close study.

Mr. Gutekunst, of Arch street, Philadelphia, exhibited a superb collection of his fine portraits that need no commendation from us; they are masterpieces of this class of photography. He also exhibited a fine collection of phototypes, photo-mechanical prints by his process and well worthy of study; they were exceedingly good samples of this phase of photographic progress.

Mr. John Carbutt had a fine exhibit of views made on his orthochromatic plates. They were certainly wonderfully good witnesses of the utility of this class of photographs. The detail in the shadows, the extremely soft gradation of light and shade and the generally faithful rendering of the various scenes were very pleasant features of the entire exhibit.

Mrs. S. M. Cleveland exhibited a fine series of studies, generally home-like scenes, and well thought out. Photographically they were excellent.

Harry T. Duffield, of the New York Society, showed a number of excellent landscapes and one or two studies that were well done and give promise of some fine work from this exhibitor.

Charles H. Currier, of the Boston Club, had a few pictures, but several were fine pieces of photography. "A Dress That our Mother's Grandmother Wore," a study in old costume, was excellent; *Little Arthur*, in "Rosedale," was also very fine.

Miss Catherine Weed Barnes, of the New York Society, showed a number of interiors, in which she excels; the work in every case exhibiting care and a very careful study of lighting.

William H. Rau, of the Philadelphia Society, had an excellent exhibit. His bromide enlargement, "A Misty Morning in New York Bay," was a fine picture. Also "Valley Green, on the Wissahickon," an albumen print of an uncommonly pretty view. The flash-light pictures in this exhibit were also fine.

Morris Earle's picture, "Crossing the Log Bridge," was a little gem; also the one entitled "Celebration of the Fourth, Cleoris Dam," both pictures being fine specimens of photography.

F. C. Beach, of the New York Society, had a collection of pictures that were all good. "A Modern Residence at Orange, N. J.," was a very fine piece of architectural work. "Along the Banks of the Passaic" and "Approach to Paradise Green," both with a decided brown tone, were very good, the tone being admirably suited to the views.

R. T. Hazzard, of the Philadelphia Society, had an excellent collection of studies, by far the greater part of them of the highest merit. "The Old Oaken Bucket," a picture of a country well, was very good. "A Capital Joke," two colored boys, one telling a story which the other is laughing at most heartily, was very well caught and made a very effective study. "The Village Smithy," the interior of an old-time country farrier's, was another excellent picture. One view called "The Gossips," a group of old ladies chatting, was an excellent idea; but was spoiled by the poor background, which was neither artistic nor attractive.

Charles H. Davis, of the Plainfield Club, had an exceedingly artistic exhibit. A portrait of a laughing lady was unique and very pretty. Another portrait of a lady in furs was a very fine piece of work, especially the furs, which were very perfectly caught. Yet another portrait, of a lady in a white dress beside a window, was also very good. We have seen very little professional portrait work that could surpass these pictures. The arrangement of the exhibit was also unique and particularly artistic. The frame, without glass, was made of rough, undressed pine, with rope scroll work as a decoration, a very effective application of crude materials.

W. A. Greenwood, of Falls of Schuylkill, had a very fine flash-light "portrait of a gentleman," and a capital bromide enlargement from a cabinet negative entitled "Look, Mamma, Hobby Horse."

Edward F. Wilder, of the Boston Club, had a good exhibit, which contained some excellent portraits.

E. M. Pine, of the Philadelphia Society, showed some very fine pictures, the interiors being particularly good. In this exhibit we found a combination picture that was unique in being a combination of daylight and flash-light. It was entitled "The Salutation." A gentleman passing in the street outside is saluting a lady sitting at a window inside. The first view is taken by daylight, the latter by magnesium flash at night. The combination is very striking. A bromide enlargement from $4\frac{1}{4} \times 6\frac{1}{2}$ negative of two colored children in a cotton-field, and called "Cotton and Wool," was very well done.

H. A. Latimer, also of the Boston Club, has a large collection of some of the best pictures in the exhibition. Some of the scenes along the Massachusetts coast and in Florida were excellent, particularly those of surf. A frame of studies in this exhibit were very effective, especially "Mediation," which was a

very pretty picture of a lady apparently in this mood. Another of these, called "A Bowery Boy," was typical of one of the rough characters of the well known street.

Frank Bement, of the Philadelphia Society, had a very fine exhibit of photographs of machinery. This is a very difficult task to make good work with, and the exhibit was certainly one of the best we have seen.

Frank M. Sutcliffe, of Whitby, England, had a most beautiful collection of views. All the pictures were full of artistic feeling, and each had a story to tell full of life and incident. "Rising Mist," a team of three horses with a harrow, and a most wonderful effect in the atmosphere, was very fine. "Winter-time," another of those English farm scenes, with horses and plow, was also full of beauty in its atmospheric effects. "Early Lovers," a country boy and girl, with their rustic garments, evidently much interested in each other, was also very good. "Under the Capstan," a group of fisher-girls knitting; also, "In the Dull Season," fishermen gossiping; "Girls Knitting," a group on stone bulk-head of pier, are a few of the more beautiful pictures in this uncommonly fine collection.

W. G. Preston, of Boston, had some very unique pictures called "I, Me and Myself," after the manner of Colonel Pennington, shown in the BULLETIN some time ago. In one of these three positions of the same individual are shown; in another, two, one position showing a headless trunk, with the hands holding the head on a pillow.

The Rev. F. C. Lambert, of the Camera Club, London, had a very beautiful collection of views and studies. "When the Day is Far Spent," an old couple at the door of a thatched cottage, was an excellent study, rustic, artistic and thoroughly characteristic of English country life. A view of "St. John's Chapel and River Cam," Cambridge, England, was a gem of its kind, and much of its beauty as a picture was brought out by judicious vignetting.

William Parry, of Newcastle, England, had some handsome interiors and also very excellent views of English and other iron-clads.

W. H. Geddes & Sons, of Arbroath, Scotland, had a couple of fine studies. "News from Abroad," a combination print from four negatives, was very finely done. It represented an old couple sitting beside an old open grate fire-place, as seen in the rustic cottages of England; the old man is reading a letter, and his better-half is listening intently, with her hand behind her ear, to catch every word. The picture was full of life and feeling. "The Smith," a combination print from two negatives, was also very good.

Paul Lange, President of the Birkenhead Society, England, had several fine views of frost scenes that were very well done and particularly beautiful.

Richard Keene, of the Derby Society, England, also had a very fine collection of views, mostly of Hardwick Hall, Derbyshire, and scenes in Warwickshire and Derbyshire, all beautiful and very well done as photographs.

Mr. and Mrs. W. J. Anckorn, of Arbroath, Scotland, showed an excellent set of studies. "Auld Robin Gray," a Scotch interior group, was very good. "Auld Granny's Leather Pouch," an inquisitive boy investigating the leather satchel of an old dame while she is interested in reading, was also very effective. "Man was Made to Mourn," an old man reading Burns, was another full of life and feeling.

Alfred Stieglitz, of Berlin, showed a number of the most beautiful Swiss Alpine and glacier views we have ever seen; the cloud and ice effects were magnificent.

George West & Sons, of Southsea, England, had a fine collection of their wonderful yacht pictures. We have yet to see a poor piece of work done by these gentlemen. They are always sure to give us gems in their pictures of yachting scenes, a field of photographic work they have made their own.

J. Pattison Gibson, of Hexham, England, had a superb collection of views, that it is impossible to give a just idea of, they were so very beautiful. The titles will give an idea of the scenes: "We Watch the Speckled Trout Glide By," "Under the Haycock, Fast Asleep," "When Autumn Skies Smile Sweet

and Calm," and others. Every picture was a gem of thought and artistic feeling in every particular.

Dr. P. H. Emerson, of Chiswick, London, had a fine collection of photo-gravures of his beautiful studies, each one artistic, and telling in the most perfect manner the story they were intended to relate. Some few were pictures of scenery; these also were beautiful and very artistically caught.

And now, last, but by no means least, we come to the beautiful views of Professor S. W. Burnham, of the Lick Observatory, California. These were pictures of interiors in the Observatory, and some very wonderful land and mountain scenes around Mount Hamilton. Among the collection were the beautiful moon pictures, which our subscribers are acquainted with from the illustration in our January issue.

The transparencies shown at Philadelphia were certainly below the mark, both in number and quality, compared with previous exhibitions. There was one exhibit that is worthy of notice and which saved this part of the exhibition from being an entire failure. This was the collection of Hamilton Emmons, of the Boston Club. His transparency enlargements from 4 x 5 negatives, of the "Yosemite Falls," and other Yosemite views, are excellent, and merit high commendation.

Looking back over the entire exhibition, we cannot help a few reflections. In the first place, the Englishmen are ahead of us in landscape work; but many of these were professionals. Nevertheless, the amateurs of the British Isles are ahead of American amateurs in the same field. In composition studies America appears to hold her own, in thought, in feeling and in selection of subjects. Looking at the work of the societies, we feel very much ashamed of New York, the Amateur Society, of this city, making a very poor show, considering the number of its members.

As an exhibition it was an undoubted success, for the reason that it contained many things to study, and hosts of good lessons to be learned by those who looked at the pictures with inquiring minds. If New York can give us a better exhibition in 1890, it will be fine indeed. We believe she can. Then let all work for it, and begin *now*.

A COMPARISON OF DEVELOPERS.

BY LYONEL CLARK.

[Before Camera Club Conference, London.]

NATURAL historians will tell you that whenever a new species is introduced into a new country, it begins to multiply and increase to a most alarming extent, but after a few generations Nature re-asserts her ordinary law and the new settler settles down to its ordinary and normal rate of increase. In photography we find somewhat of a parallel: the advent of any new process is received with a burst of enthusiasm, its application is universal, and its merits or faults are extolled or condemned with as much exaggeration as any unpopular Government measure in Parliament, and it is not until the first effervescent exuberance of its disciples or the deep anathemas of its opponents have subsided, that it is possible for the still, small voice of Reason to make itself heard, and allow the new-comer to be judged strictly on his own merits.

Our latest advent from other climes is quinol; this is, however, not of foreign origin, being no other than an indigenous species, which, under the name of hydroquinone, was first proposed and introduced to the photographic world by our worthy President, and that in this very room, and from the rostrum that I myself am now occupying. On its first introduction, however, it did not meet with any general favor, and it was not until, like old brown sherry, it had made

a voyage across the seas and back, that it was found good enough for the palate of our connoisseurs.

Slight as was the enthusiasm with which it was first received, its restoration to the land of its birth was, however, attended with the most fulsome flattery, and all that exuberance of expletives for which our Gallic brethren are so justly famous. The new developer was to do anything and everything : a very conjuror's bottle, out of which could be got the restrainer of over or the accelerator of under-exposure—a very panacea for all our photogenic woes or maladies. One loquacious apostle of hydroquinone, carried away by his own enthusiasm, actually went so far as to style it an “automatic” developer, thus abolishing at one fell swoop all the science and beauty of development, and all the power that chemistry has put into our hands, to compensate for its own shortcomings, or the unwillingness of nature, and to enable us to relieve our beloved pursuit from the reproach that it is a mere mechanical process.

But these furious atmospheric disturbances have now subsided : we have left the roaring forties of exaggeration for the quiet doldrums of reason, and quinol, as I prefer to call it, is on its trial at the bar of the photographic world. The case was opened by Mr. Swan, in the Photographic Society's rooms, but a short time back, when this gentleman, in a most able lecture, very fairly stated its merits. But, on the principle of an old proverb, if I may venture to say so, I do not consider that Mr. Swan carried his investigations far enough. Development is a fairly complicated phenomenon. There is something besides the mere bringing out of detail or getting density ; there are the gradations, or intensity scale of the negative, to be looked after, and this I consider the real secret of universally successful development.

A photograph of nature is made up of not only high lights, half tones and shadows, but of every gradation or nuance between these salient divisions. However white the paper we make our prints on may be, it will always be less so than the bright high-lights, and the deepest blacks of the print will be behind the dark shadows of nature. We have then to compress the scale of tones of nature into the short gamut that our printing processes give us ; and it is therefore evident that the developer that can give the greatest range to this gamut will, *cæteris paribus*, be the most useful.

To make this point clearer, a certain light intensity will give the least appreciable deposit after development on the sensitive film, whilst the darkest deposit that we can admit, this point depending on the particular printing process we intend to use, we will assume to be obtained by a light one hundred times as intense. In exposing we must expose long enough for any desired detail in the shadow to impress itself on the plate. We will take this amount of light as our unit. Now, any light one hundred times as bright as this unit point will then be represented on the plate by the maximum amount of deposit possible ; and therefore any lights that in intensity are superior to this figure must all be represented by an equal amount of deposit ; that is to say, they will all give the same appearance on the print, and we shall lose all detail in the high lights. Now suppose that, by some modification of our developer, we could so manage that our maximum deposit was only attained by a light two hundred times as intense as our standard minimum, I think it will be allowed on all hands that this is not only a valuable, but an essential property.

It is to ascertain what are the capabilities of quinol in this direction as com-

pared with pyro-ammonia and ferrous oxalate, that I have undertaken the following experiments. I have not sought in any way to find out the developer that will give the most detail on a plate ; from a very exhaustive series of experiments that I made last year, I was led to the conclusion that no alteration in the constituents of the developer in any way affected the amount of detail that was brought out, provided that sufficient time were given. I believe Mr. Cadett has also come to the same conclusion, and as my present set of experiments show the same result, I think we may consider it as an axiom, that the action of light on a dry plate is absolute, and no strengthening of the developing agent can bring out what does not really exist.

Mr. Swan, in his experiments, made a comparison by means of ordinary negatives. I have seen these negatives, but I have found it most difficult to make any very reliable deductions from them, and even Mr. Swan was obliged to acknowledge that it required a long and careful examination ; I therefore in my experiments decided to use a graduated sensitometer screen, which may aptly be described as a negative reduced to its simplest expression. The plates used were the Castle Brand, the same as those used by Mr. Swan ; they were all exposed to a uniform light behind ground glass for equal periods of time. The time was taken from a pendulum beating half seconds, and every care was taken to insure the negatives being equally exposed.

The developers compared were : Pyro and ammonia, quinol and caustic soda, quinol and carbonate soda, quinol and carbonate potash, quinol and ammonia, ferrous oxalate. The pyro used was sulpho-pyrogallol, and the quinol was Byk's, and was made up the same as the pyro with four times its weight of sulphite of soda, acidified with sulphuric acid. The caustic soda was that fused in sticks. The carbonate soda was the anhydrous salt, and the carbonate potash the ordinary one of the pharmacopœia. The ammonia was the ordinary so-called 880 degrees, but I cannot guarantee its strength. The ferrous oxalate was made up of acidified saturated solutions of potassium oxalate and protosulphate of iron. The restrainer used was invariably potassium bromide.

At the risk of being prolix, I will again state exactly those points in development I was investigating. Some little time back, I saw some photographs of Captain Abney's ; they were of snow scenes in the Upper Alps, and although the range of tones between the bright reflected light on the snow and the deep shadows in the fir-trees was enormous, yet they were all proportionally represented in the photograph, both as regards the details in the shadows of the trees and in the high-lights of the snow. These plates were developed by pyro and ammonia, and Captain Abney was kind enough to make known the particular formula he used for these views, which will be found on page 24 of Vol. II. of the Camera Club Journal.

In my own mind, I set this result down as the standard of excellency that any developer must attain in order to come into universal use.

How far quinol was capable of doing this the following experiments will, I hope, show. I will not weary you by going through them *seriatim*, but rather give you my deductions.

Commencing with pyro, we find the following laws : by decreasing the quantity of pyro, the alkali remaining constant, we get loss of detail, and also loss of density in the high-lights ; if, however, we continue development long enough to bring out all the detail, then the density in the high-lights has also

increased, and the result is what I call normal. If, however, while keeping the pyro down—say, $\frac{1}{2}$ grain (all quantities are in grains per ounce of developer), and increase the ammonia up to four or six minims—we find that now we can get out all the details before the high-lights gather any great density, and, therefore, we get a long, low curve. This is precisely what we require; we have brought out the detail in the shadows, and the high-lights have not yet assumed any over-density, although by the suitable addition of more pyro we can at any time get any amount that we may desire.

Now, as to the behavior of quinol under such circumstances, I am sorry to have to admit that it totally fails; its action is very distinct from that of pyro. If we decrease the quinol we lose detail, just as in pyro, but if we increase the alkali, unlike the pyro developer, we get no increase in detail, or, what is the same thing, no increase in the speed with which it appears, unless we add the alkali to a most enormous and impracticable extent, and this is practically the same whatever alkali be used. Ammonia appears to promise the best results, but it has to be added to an enormous extent, and then green fog makes its appearance with as much vigor as in any pyro-and-ammonia developed negative.

(To be continued.)

THE ARISTOTYPE.

BY JOHN A. LORENZ.

THE artist engaged in photography, knowing the shortcomings of it, hails with joy everything new in the way of inventions or discoveries that tend to give him control over his work, so as to make it conform more to the principles of art.

The photographer will tell you that the stretching of the paper is a matter of no consequence; it is not *enough to amount to anything*. Of course it is not to him who will take a negative and remove just what he chooses, and still be under the impression that he is making a likeness; but it makes a great difference to the artist whether the proportions of the face and figure are kept or not, as well as other effects which go to make up the resemblance to its original.

We have heard at different times from men who have had schemes for getting the photographers' money, the cry like the false prophets of Scripture, lo here! and lo there! this and that will do wonderful things; and we listened—listened financially, some of us—as they promised to point out the way we were looking for; but we had to rest on the promises—there was no fulfillment.

Now I believe we have in the aristotype paper something with which we can more nearly approach a drawing than with anything that has yet been used as a medium for printing. We await hopefully, though not very patiently, for the manufacturers to overcome some defects in it that will give us a perfect paper. Its defects, we take it, will be corrected as were those of the dry plates in their early days, through the honorable competition of manufacturers, and their desire to correct defects that were pointed out to them by the craft or in whatever way discovered. Then we expect to have a paper that will not distort a picture and that will preserve the fine detail of the negative as we have retouched it; to concentrate the interest at certain points and to make subordinate others; that will keep the high-lights through the toning bath without requiring the shadows

to be over-printed ; and so give that gradation from the midnight shadow up to the highest point of light that is so pleasing in a careful drawing or engraving.

It is too much to expect that any paper can be handled with the ease and certainty of albumen paper ; but an artist will gladly take the extra pains required in the management of aristotype paper when he sees that the infinite care he has taken with his negative loses nothing in printing, instead of feeling, as he often must with an albumen print, that it has suffered something from distortion ; that while the shadows are right, the delicate sparkle of the highlights is gone ; or, if it is kept, the general effect of the print has been made too dark in order to keep it.

The high polish of the aristotype, though giving the beauty of the ivory miniature, we do not consider an essential to the art quality of the picture, but that most of all will appeal to people who judge things by the shine, that being the only standard by which the great majority judge things photographic or other ; and so, though that be the least of its good points artistically, it may, from a business point of view, be the greatest ; and so, long live the shine ! like other flattery, may it please fools and not displease the wise.

COMPARISON PRINTS FOR PROVING THE VALUE OF ORTHOCHROMATIC PLATES.

BY DR. H. W. VOGEL.

YESTERDAY I received your valuable BULLETIN, No. 7, containing two illustrations of a landscape taken with an orthochromatic, and also with an ordinary plate. These pictures should show the superiority of the color sensitive eoside of silver plate over the ordinary plate. But though my friend, the late Obernetter, and I, are the inventors of the eoside of silver plate, I must confess that in the copy of your journal before me the landscape taken with the ordinary plate makes the better impression. What is the reason ? Many thousands of eoside plates are exposed together with ordinary plates under the same circumstances, and by this comparison the superiority of the former is sufficiently proven here in Germany.

To make such proofs valuable certain conditions must be fulfilled. 1. The negatives must be taken under exactly the same conditions ; the same time, exposure and lens. 2. They must be developed together in the same developer, one as long as the other. 3. They must be *printed under the same conditions*, by any light printing process, or else by collotype. 4. If they are reproduced by collotype both prints must be made from the same collotype the same length of time. It is well known that prints from collotype plates differ in intensity according to the strength of the dye and the quantity of it rolled on. Therefore *only those prints or pictures are comparable which are printed together on the same sheet of paper*. These pictures should have been mounted together, and that has been omitted in the BULLETIN. I note a light printed specimen on an ordinary plate united with a dark printed one from an eoside plate. By this failure a true comparison of the two is impossible.

BERLIN, April, 1889.

NOTE.—We are very much surprised that Dr. Vogel obtained such a poor specimen of the BULLETIN illustration as to lead him to write the above note,

and sincerely hope none of our other readers have encountered the same difficulty. All the prints which we have seen have proved beyond a doubt the superior qualities of the eoside plate. But what Dr. Vogel says about comparisons is well worth noting, and therefore we give his letter in full. We expect to show more work with the eoside plate in the future, and shall profit by the advice given above.—Eds.

THE ORTHOCHROMATIC PICTURES.

LAWRENCE, KANS., April 20, 1889.

To the Editors of the BULLETIN :

In regard to illustrations in issue of 13th inst. there is a striking difference in the matter of definition. The one on the ordinary plate lacks detail in the distance very much as if it had been taken through a large stop. The one on the orthochromatized plate defines the distance sharply, and must have been taken with the lens stopped down. We are left to suppose that the difference is due to the different plates, but this special difference looks like a difference in diaphragms.

Respectfully,

T. B. SHANE.

ED. NOTE.—The difference is due to the plates in every case.

JUBILEE EXHIBITION AT BERLIN.

RULES, ETC.

1.—Exhibition takes place from the middle of September to middle of October.

2.—The Exhibition has *five* divisions :

- a. History of Photography and its Applications to Science, Art, Industry, etc.
- b. Portraits and Landscapes of Artistic Value.
- c. Photo-mechanical Printing.
- d. Apparatus and Chemicals.
- e. Photographic Literature.

3.—Members and non-members, professionals and amateurs, are admitted as exhibitors.

4.—Applications have to be made to Dr. W. Zenker, Wichmannstrasse 17, Berlin W.

5.—Every exhibiting member pays per square meter of wall, table or floor surface, 4 marks ; non-members, 8 marks.

6.—The Exhibition goods have to be in place August 31st. Address: Royal Academy Building, "Unter den Linden," No. 38, Berlin W.

7.—Exhibitors and their representatives have free admission to Exhibition.

8.—It is the intention to issue diplomas of excellency, etc.; no particulars yet.

9.—Articles from the United States will be collected by E. & H. T. ANTHONY & Co.

10.—Shipping expenses both ways are paid by the exhibitor.

11.—Exhibits cannot be withdrawn before the close of the Exhibition.

12.—The Society insures the square meter up to 100 marks. For other damages the Society is not responsible.

13.—Pictures may be framed or not at the option of the exhibitor.

14.—It is recommended to mark on the picture lens it was made with, developer, time of exposure, date, weather, etc.

PHOTOGRAPHIC LITERATURE.

To the Editors of the BULLETIN :

I notice in your issue of April 13th a report of a discussion, at a meeting of the Photographic Section of the American Institute, upon the reliability of the information given in our photographic literature. I am afraid that if we cornered those men who say there is never anything in our journals, we would find that nine-tenths of their knowledge has been derived from such sources. The truth is that contributors give us what they deem best and most important, and it remains for the intelligent and thoughtful reader to bring these statements of fact to bear upon each other, and to so fit one into the other that the whole truth is obtained. Like others of nearly thirty years' standing, I expect to see repeated over and over again by others the experiences of my younger days, as well as a revival of old styles and methods; yet even this constant reminding of the past is a very good work.

I must say that even during the last year I have received points from the BULLETIN that have been invaluable, and probably worth hundreds of dollars, simply because they fitted in at the right time.

Our brains are very like our internal economy. A medicine will affect two men differently. In one case it will enter into the blood and revive the man, clearing his brain and imparting new energy. In the other case it simply does nothing. Many a seemingly simple statement recorded in the BULLETIN, the result of weeks or months of research, hinges upon most important issues if it strikes the thinking man at the right time.

It gives me much pleasure to bear testimony to the reliability and "aliveness" of your most welcome magazine. I am yours, W. J. TOPLEY.

OUR ILLUSTRATION.

SOME time ago Mr. Haywarde S. Cozzens sent us a number of excellent pictures for criticism. We found them to be so well done from both artistic and photographic standpoints that we determined to capture at least one of them as an illustration for the BULLETIN. The frontispiece of this issue of our journal is a very good photo-mechanical print from the view selected. It is one of those charming scenes up in the New Hampshire mountains that gives such a restful feeling to all who are fortunate enough to enjoy them. Among those glorious hills, with their ever-changing phases of cloud and sunshine, life passes as a dream, and the world below seems like a boiling caldron, with its rush and bustle. We are glad to be able to present to our readers a glimpse of one of the peaceful farming scenes of the region we speak of. The quiet team of oxen, the field with its fresh grass, the trees in the distance and the neat farm-house, give us an air of country life that makes us almost feel now the refreshing breezes that play among those old hills. We must congratulate Mr. Cozzens on having caught so faithfully the spirit of the region where he took his picture.

A PHOTOGRAPHERS' TRUST.

OUR publishers request us to present the following statement to the readers of the BULLETIN:

We have noticed in the *New York Times* of May 16th an article copied from the *Buffalo Despatch* relative to a photographers' trust, which implies a combi-

nation being formed for the advance of the price of work of photographers. It is well known that many photographers have advertised to make cabinet photographs at \$1 a dozen, and it is ruinous to photographers at large, and to themselves. No one can afford to make pictures of excellence that are works of art for this price, and anything that would be for the interest of photographers, whereby a remunerative amount of money could be made on their work, ought to be sustained by every well thinking photographer. We have seen some garbled reports that do not fairly represent the position which we take in the matter, and we would not want to be placed in such a position as to have photographers think we were not in sympathy with them to form any plan which would be advantageous to the greatest number in the profession, and we will, as we always do, use our best endeavors to advance the interest of photographers, and whatever may be done for their interest will also be for ours and for the interest of every dealer in photographic materials. E. & H. T. ANTHONY & Co.

"BOSTON ILLUSTRATED."

The following letter, received from Mr. W. Garrison Reed, speaks for itself :

AMATEUR PHOTOGRAPHIC ASSOCIATION,
Crescent Chambers North, 3 Lord Street,
LIVERPOOL, April 9, 1889.

DEAR SIR,—I beg to acknowledge the safe arrival of the set of slides, "Boston Illustrated." They were exhibited at our meeting April 4th, and were much admired. The getting up of the whole thing is a model for imitation. I am requested by our Association to write to you and tender our hearty thanks to the Boston Camera Club for the gift, and to say that we shall have much pleasure in accepting the trust, and in facilitating, in all ways, its full use. I have already a number of applications for the set. They are being exhibited in Manchester to-night; they will be in Birkenhead on Thursday, the 11th inst.; London Camera Club, 18th; Glasgow, 23d; Warrington, 30th; and I have applications from Gloster and Hull, dates not yet arranged.

I confidently anticipate that the idea will be taken up, and that you will, in due course, receive similar sets of slides.

Believe me, Yours very truly, WALTER A. WATTS,
TO WILLIAM GARRISON REED, *Hon. Secretary.*
Boston Camera Club.

TWO MORE VETERANS.

OUR publishers have received the following in recent letters to them :

"In your last issue Mr. Notman lays claim to being your oldest living customer. I dispute his claim and go him a year and a half better (1855). In that year I made two half-plate daguerreotype views on plates from Mr. E. Anthony. Yours very truly, J. A. PALMER."

THE following is written on an old invoice from E. H. Alley :

"In BULLETIN you speak of your oldest living customer. Look at the inclosed and correct record. * * * I was in the store the year before the date of this bill (May, 1858)."

In this latter case it is curious to note the prices of photographic materials: 1 pound collodion, \$1.50; ½ pound silver nitrate, \$9; 3 yards plain background, \$1; 1 scene background, \$6.50; Snelling's Journal, 1858, \$2. We are very glad to note that our good friend did not neglect photographic literature in his early days, and he is still faithful in this respect.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

ROCHESTER CAMERA CLUB.

THIS Club was organized January 3, 1889, with a charter membership of fifty, and the following members were elected officers for this year: President, G. Hamner Croughton; First Vice-President, George W. Rafter; Second Vice-President, Samuel H. Lowe; Secretary, Peter Mawdsley; Assistant Secretary, J. Louis Willard; Treasurer, James Streeter. Executive Committee: Henry W. Mathews, Chairman; James Streeter, H. E. Townley, and the President and Secretary ex officio. Finance Committee: Edwin W. Horne, John Carey, A. S. Clackner. Regular meetings and social meetings are held Thursday evenings alternately. The rooms of the Club are in the Kirley building, on East Main street, and consist of the meeting room and a large and commodious dark room. The regular meetings are devoted to the regular business of the Club and a demonstration. A paper follows. The evenings of the social meetings are informal affairs, and the members meet to talk over their successes and failures, and the inexperienced member finds some one to aid

him in development of some plate he dares not risk himself. The following is a list of the events that have taken place at the regular meetings since the organization.

January 17th: The Club made a test of several flash lamps and compounds. The best results were obtained by the lamp burning pure magnesium.

January 31st: The merits of four different developers, two pyro and two hydroquinone, were tested on an 8x10 plate that had been exposed, then cut into quarters. There was very little difference in the results, the President deciding that the result was slightly in favor of pyro.

February 14th: The thanks of the Club were tendered to the publishers of the different photo journals for favors received, and the Secretary instructed to notify them of the same. The Club was then entertained by one of its members, Mr. C. C. Goodale, who exhibited lantern slides from negatives made by him in a trip through the island of Hayti.

February 28th: Several new members elected, and the Executive Committee announced the offer of Mr. W. Garrison Reed, on behalf of the Boston Camera Club, of the loan in the future of "Illustrated Boston," which offer was accepted with thanks; and the Club resolved to try their hand at illustrating Rochester after the manner of Boston. The President appointed Mr. C. Fred. Hovey, Peter Mawdsley and John Carey a Committee to carry out the above resolution.

March 14th: The demonstration consisted of making transfers with transferotype paper and was successfully carried out.

March 21st: The Club gave its first lantern exhibition at the Damascus Temple, about one hundred and sixty slides being shown, all being the work of members. The hall was crowded and every one well pleased.

March 28th: The enlarging on bromide paper with a Cooper enlarging lantern was finely shown by the President, Mr. Croughton.

April 11th: Negatives made by the Kodak were developed and made ready for printing from. At the next regular meeting it is intended to show the carbon process.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held Wednesday evening, April 3, 1889, with *Vice-President* John G. Bullock in the chair.

The *Secretary* reported the following donations to the library:

A pamphlet by Conrad Beck, "On the Construction of Photographic Lenses," by Messrs. Morris Earle & Co. A series of photographic plates entitled "Pictures from Life in Field and Fen," from the author, Dr. P. H. Emerson, of London, England. Both gifts were acknowledged by a vote of thanks.

The Committee on Lantern Slides reported as follows:

The slides last received through the American Lantern Slide Interchange were those of the St. Louis Camera Club, and were shown at the Conversational Meeting, March 20th. The general average of these slides was high, and the set, which comprised fifty gelatine positives, gave evident enjoyment to the members. The work of J. W. Dunn, including some views of an ice pack upon the Mississippi, winter sports and a figure study; a dog sitting for his portrait—"A Study in Portraiture," and other figure compositions by Robert E. M. Bain; a flock of geese and a church interior, and other specimens of the work of the Rev. C. M. Charroppin, S.J.; animals, by William M. Butler, and some excellent marine views by W. W. Withnell, were especially worthy of notice.

Slides were also shown by members of the Society as follows: By Mr. John Carbutt, of views in Pike County, Pa., made on orthochromatic plates; Mr. Henry Harrison Suplee, Mr. Thomas Wakeman Lane, Mr. O. D. Wilkinson, Dr. A. Graham Reed, Dr. C. L. Mitchell, Mr. J. A. Shulze, Mr. Frank S. Lewis; some fine studies of ducks and other barn-yard animals caught with a Detective Camera; Mr. Edmund Stirling, and Mr. William H. Walmsley.

The American Lantern Slide Interchange has organized for 1889 by the election of George Bullock, of the Cincinnati Camera Club, as manager; and William H. Rau, of the Photographic Society of Philadelphia, and F. C. Beach, of the Society of Amateur Photographers of New York, as assistants. The Philadelphia Amateur Photographic Club has withdrawn, and the New Brunswick Cameras have been admitted to the Interchange.

The Committee on Joint Exhibition reported that the exhibits had all been received and were being placed in position in galleries of the Academy of the Fine Arts. The exhibition would comprise nearly seven hundred frames from over one hundred and fifty exhibitors, including about twenty foreign photographers. In addition to this there were about fifty lots of lantern slides and transparencies. The programme agreed upon provided for the gal-

leries being open from 10 A. M. until dark, and from 8 to 10 P. M.

Special exhibitions of lantern slides will be given upon Tuesdays and Thursdays, at 8 P. M., the first of these evenings being devoted to the slides received for the American Interchange from the Camera Club of London, and the others to miscellaneous exhibits. The following gentlemen had consented to serve as the Board of Judges: Messrs. John C. Browne, George W. Hewitt, James B. Sword, Xanthus Smith and Frederick B. Schell.

The Committee on Membership reported the election of the following active members: Messrs. Francis Burrows, J. Milnor Walmsley, Elmore C. Hine, M.D., and William A. Cheyney.

Mr. John C. Browne presented to the Society, on behalf of Mrs. Corlies, a framed portrait of the late Treasurer of the Society, Mr. S. Fisher Corlies, remarking in his brief address that no portrait could more thoroughly deserve a place of honor in the room of the Society. A cordial vote of thanks was tendered to Mrs. Corlies for her most acceptable gift.

Mr. Rosengarten showed some prints on a new paper known as The Buffalo New Enamel Paper. The paper was intended either for contact prints or enlargements, the exposure being by gas or lamp light, and the development similar to other gelatino-bromide paper.

Adjourned. —

MINUTES of the stated meeting held Wednesday evening, May 1, 1889, the President, Mr. Frederic Graff, in the chair.

The Secretary reported the receipt of a circular containing the programme of the International Congress of Photography, to be held in Paris, France, during the Exposition of 1889, and inviting the attendance of members thereto.

It was also reported that a number of picture exhibits, by Mr. Frank M. Sutcliffe, at the late Exposition, had been presented by him to the Society, and a vote of thanks was passed for the same.

The Committee on Membership reported the election of the following active members: Dr. James J. Nelson, William A. Sullivan, John H. Bradway, Daniel W. Grafly, Dr. Samuel D. Risley, J. H. Hooven, Walter R. Furness, Rev. Henry A. F. Hoyt, William Howard Turner, Joseph Gray Martin.

Mr. W. E. Barrows showed some excellent cabinet portraits made by means of the Welsbach light, by Mr. Rockwood, New York.

Dr. Charles L. Mitchell showed and described Barnett's Universal Film Carrier, adapted for using celluloid films in ordinary plate-holders.

Mr. Morris Earle showed one of the Hawk-eye Detective Cameras, fitted with a roll holder for paper negatives, and also for use with ordinary holders containing glass plates or films.

He also showed some transparencies called by the makers (Messrs. Williams & Brown) "Linotypes." They were photographic prints on linen mounted as transparencies, with washes of color applied to the back, giving them a pleasing tinted effect.

Mr. Burrows showed an improvement on the flash lamp exhibited by him at a recent meeting, in which the usual rubber tube and bulb were done away with. A spring, released at the proper moment, threw the flash powder upward and outward into the flame. This arrangement allowed the lamp to be constructed in very compact form. The lamp shown was adapted for use with ten to twelve grains of powder.

Adjourned.

ROBERT S. REDFIELD,
Secretary.

LOWELL CAMERA CLUB.

THE Lowell Camera Club held a special meeting April 16th, to consider the subject of lantern slide making, and to arrange for an exhibition of photographic work and a Club field day. There were fifty present.

It was voted to hold an exhibition of photographic work in the fall. The necessary committees were appointed for this exhibition and for the field day.

Mr. J. D. Gould read the paper on the subject for the evening. He explained the making of lantern slides for the benefit of the beginner, as well as to help the practical worker.

He showed the advantages that the reducing process has over the contact method. In regard to development he said all were agreed upon this, that there must not be the slightest trace of fog in parts to be shown upon the screen as high lights. These must be clear glass. To get this result a rather short exposure is given, and less development than would be considered correct for a negative. A little detail is sacrificed to obtain contrast.

To get clouds in slides he recommended using cloud negatives for an extra slide, removing the film on the part of the cloud slide

that comes over the landscape to be shown, and then seal the two together in the ordinary way. He cautioned the beginners to be sure that both slide and cover are perfectly dry before sealing together. He suggested that it would be of great interest to other clubs in the proposed New England Exchange if one club would work the coming summer with the idea of producing a series of slides illustrating Lowell and surrounding country, showing the principal streets, the mills that have made the city what it is, and, not the least, the beautiful views that may be found all along the river's banks.

Much interest was manifested in the elaborate apparatus, made by himself, which Mr. Gould used to practically illustrate his subject. Some plates were exposed in this camera, and Mr. Charles Francis, who has had a good deal of experience in slide making, developed the plate before the Club. He used the oxalate and the hydroquinone developers, explaining the process and comparing the merits of the developers used.

Mr. W. E. Badger used his lantern to show a large number of views upon the screen from slides made by members of the Club.

Honorable Charles H. Allen furnished some very interesting slides showing the views of the Hot Springs in the National Park.

This meeting closed the series of meetings of the Club for the season. The next regular meeting will be held in November.

GEORGE A. NELSON,
Secretary.

AMERICAN INSTITUTE — PHOTOGRAPHIC SECTION.

CLINTON HALL, 19 ASTOR PLACE.

INFORMAL MEETING, APRIL 17, 1889.

Vice-President J. B. GARDNER in the chair.

The following subjects were announced for the regular meeting of the Section, May 7th: "Pictorial Composition," by J. Wells Champney; "Recollections Concerning Art in the Old World," by Professor S. J. Pardessus.

The mention of these well known artists naturally suggested and gave rise to some remarks concerning "The Inter-relation of Art and Photography."

Mr. O. G. Mason said: "I remember a time in the history of photography when there appeared to be no relation between art and photography; or, rather, when artists, as a rule, denied all relationship, and consigned the photographer to the realm of the mechanic arts. This belief, however, is now rapidly

passing away among all those artists who have become familiar with the capabilities of photography and who find it a help in their study of art. These have learned that it requires something more than mechanical and chemical skill; and they have learned, too, that not merely artistic ability is important in accomplishing the best photographic results. Hence it can readily be accounted for why the meetings of the Photographic Section during the past two years have been so largely patronized by students of art, and why artists of acknowledged ability have been ready to contribute to our instruction and entertainment. My present belief is, that as the real and varied requirements photography imposes become familiar to those engaged in other professions, the status of the accomplished photographer will be more truly estimated and his claim as an artist more readily acknowledged."

Mr. J. B. Gardner said: "From the earliest public announcement that pictures could be made without the aid of pencil or brush to the present hour, artists have contended that photography was nothing more than a mechanical art, and that it was a misnomer to call a photographer an artist! Jarvis, in his 'Art Thoughts,' says: 'Photography is no art, but a process of science to which art may add grace and beauty. As commonly practiced, it is a chemical handicraft and not to be spoken of as art.'

"This impression appears to be very general among artists; and it is no wonder, therefore, that their names are not recorded, to any extent, among the explorers of photography. The names most prominent have been those of scientists and students of natural philosophy. During the early days of the daguerrean art, the field was occupied by a great variety of talent. The tradesman, the shoemaker, the barber, the carpenter and the clergyman, all regarded themselves equally competent to practice the art. This general ignorance of the real requirements of the business led to a development of the art that might have required a much longer time if confined to any one of the above named classes; for the chemist-photographer soon discovered that he could make more by supplying his fraternity with the needed chemicals than by making pictures. The optician had a similar experience in the making of lenses; and also the carpenter in constructing suitable apparatus. So each in turn served the other in that portion of the work in harmony with his individual aptitude, and in this way every

department of the art was soon classified and rapidly developed. It was not, however, until the collodion process was successfully practiced, that artists (of any sort) were induced to join the ranks. Through their influence was soon developed a taste for photographs in colors, in ink and pastel, and also a numberless variety of fancy backgrounds and æsthetic surroundings. And so it happened, that during the whole history of the daguerreotype the professed student of high art failed to discover how a knowledge of making sun pictures could in any way help him in his work. In fact, he regarded these pictures as an obstacle to his success and a means of perverting public taste in matters of art. During these later days, however, a change has come over the spirit of his dreams, for he has learned by experience that sun pictures have constantly increased the demand for works of art and materially aided him in their production. They have widened the field of his labors, and made his name familiar to all readers of the leading and most popular illustrated monthlies of the present hour. It is safe to say, that the publishers of these journals, by calling photography to their aid, have done more to popularize art and increase the demand for artistic labor than all other influences combined. Thus the value and use of photography has been greatly increased; for it has marched hand in hand with the artist and so furnished countless illustrations attainable only by this combined force."

At the conclusion of Mr. Gardner's remarks, the question was asked whether the wet or dry plate process was the most practical in meeting the requirements of artists, engravers and publishers. This question was but briefly discussed when the Chairman announced that the usual time for closing had arrived, and, if thought advisable, this subject would be taken up at the next informal meeting, which would be held on the third Wednesday in May.

The Section then adjourned.

REGULAR MEETING, MAY 7, 1889.

President H. J. NEWTON in the chair. The Secretary stated he had received for the Section the usual literary contributions, and also a number of copies for distribution of the *Beacon*, a journal devoted to photography, published monthly in Chicago.

The usual vote of thanks was tendered for the above named, and the President called for the reports of Committees.

The Executive Committee reported that at the next regular meeting there would be a lantern exhibition of choice views taken on the three days of the centennial celebration of Washington's inauguration as President of the United States. A social meeting was also announced for the 15th of May, and a cordial invitation extended to all interested in a discussion on the merits of either wet or dry plates. The subjects and speakers of the evening were then announced, and President Newton presented to the audience Mr. J. Wells

Champney, who occupied the first hour in discussing on, and illustrating by means of the black-board and the stereopticon, the subject of "Pictorial Composition." Mr. Champney was listened to with marked attention, and his very clever manner of handling his subject contributed greatly to the pleasure of his auditors. As the pictures were projected from the lantern, he named by whom the negatives were made, and clearly pointed out their merits or demerits from a pictorial point of view, leaving their photographic excellence to be judged of by those skilled in the art.

The work of some of our most distinguished amateurs comprised the greatest portion of the exhibit, and, from a technical point of view, compared favorably with the productions of our leading professionals.

Without doubt it was one of the most instructive and entertaining exhibitions of the season, and was so acknowledged at the close of the meeting by a unanimous vote of thanks to each and all of its contributors.

Professor S. J. Pardessus followed Mr. Champney with a very interesting paper entitled "Recollections Concerning Art in the Old World." This paper consisted mostly of entertaining pen-and-ink sketches of noted artists and their work. It was crowded with amusing incidents, and the author related these with an ease and grace of manner only possible to the practical speaker who is thoroughly conversant with his theme.

The lesson learned by every student of photography who attentively listened to both Champney and Pardessus could not fail to be impressed with the near relationship of art to photography, and how neither could afford to ignore the other.

Mr. J. Lightowler, who, in the absence of Mr. A. D. Fisk, volunteered his services as operator of the stereopticon, closed the evening's programme with a few excellent pictures selected from a series used by him in his professional entertainments.

A resolution was passed that the Chairman appoint a Committee of three to make suitable arrangements for the Annual Field Day excursion. In compliance with which he named Messrs. J. B. Gardner, A. H. Elliott and O. G. Mason.

On motion the Section then adjourned.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—E. H. writes: Why will not hydroquinone developer answer for contact bromide prints? I have tried it and apparently the result is the same as the ferrous oxalate process. I say "apparently the same," as I am not experienced enough to judge as to whether

or not I am losing some artistic effects. I cannot find a word about the matter in any of the books. How about permanency, liability to stain, length of time for washing, etc.? Please tell me fully on the question. I inclose a print treated with hydroquinone, and you will do me a great favor to criticise this print, negative, etc. I make bold to ask all this, as local photographers are a little cautious about giving points, and I have several friends watching my progress in order to make their decisions as to cameras, etc., for a summer campaign. Particulars: 4 x 5 Anthony Detective Camera. 1. Dallmeyer Lens. Stop marked 10. 2. Distance about 10 feet. 3. Time, 2.30 P.M. Bright sunlight. 4. Plate, Cramer No. 80. 5. Plate and print developed with hydroquinone according to the Stanley formula. 6. Subject, child in a swing. Queries: 1. Is the plate developed enough? 2. What causes the dark corners and light central spot on the ground? These dark spots on some negatives run up the entire side and ends, reducing the size of picture very much. I inclose a second print, a street scene. Large stop, slow shutter, Stanley Plate 25. Please to "go for" that also. I saw some prints a few days since which had the same gloss as bromides but were blue, and also some a grass green. What was the paper and do you sell it—price, etc.?

A.—Hydroquinone can be used for bromide prints very well indeed, and notes to this effect have appeared from time to time in the BULLETIN. You will probably get a much finer gradation of lights and shadow with hydroquinone than you do with oxalate; therefore the artistic effects will be superior. The prints will be just as permanent, but may require a little longer washing. The print you send is quite good, but appears to be from a negative a little out of focus. Use a focusing glass upon the ground glass and not too large a stop. In a good light the lens may be stopped down one-half to ordinary instantaneous work. The plate appears to be well developed, but we could not judge of this well without seeing the negative. The dark markings are due to a slight fogging which appears on all very rapid plates when they get old; the emulsions are always carried too near the fogging point. The second print is very good, except a dirty bluish spot in the center, which is possibly due to imperfect fixing. The focus in the latter case is much better than that in the first print.

Q.—C. A. B. writes:—I wish to ask for a little information concerning the

hydroquinone developer. I make my own developers and have tried nearly every formula which has appeared in the BULLETIN, but my experience has been that they all require a longer exposure than with pyro. Will it work as quickly as pyro if made properly? Is there any way to keep it clear? What effect will dampness have on sensitized albumen paper?

A.—Hydroquinone works much slower than pyrogallol, and herein is its advantage. You have a greater command over the progress of the development. It does not require longer exposure, but the development goes on much more uniformly and slowly. The various formulas given containing sodium sulphite should keep clear; but you may use about 30 grains of meta-bisulphite of potash in 16 ounces of developer and get a much better result for keeping clear. An ordinary amount of dampness, and when not for too long a time, does no special harm to sensitized albumen paper. But if the paper becomes mildewed it will be ruined.

Q.—R. S. B. writes: Give me, or direct me where I can find, directions for making the easiest and safest cold emulsion for a good, dense, moderate landscape plate?

A.—See the articles on Emulsions by Professor S. B. Newbury, in the BULLETIN for 1886, pages 196, 232 and 746.

Q.—C. St. J. McK. writes: I take the liberty of asking you some questions which you would greatly oblige me by answering in the next issue of the BULLETIN. Would a wooden tray, thickly coated with black asphaltum varnish, answer for a silvering bath? Would one lined with plaster of Paris answer the same purpose? Lately I have been trying some experiments with trays built up of glass (sides and ends cemented to a sheet), but can't find a cement that will hold the glass together and be acid proof. Can you give me a receipt or recommend such a cement? Have tried stratina, but acetic acid cuts it.

A.—We would not recommend asphaltum varnish for a silver bath. It is better to coat the bath with melted paraffine wax, applied hot to the bath, which should also be thoroughly dry and hot. This latter method is very effective. Plaster of Paris would get soft unless also coated with paraffine as above. We know of no good cement for this purpose.

Q.—F. C. writes: Can you give me any information for making gelatine plate for use on printing presses—a process whereby portraits, buildings, etc., can be made by the "gelatine process" to print directly from the

gelatine plate? Perhaps you can give me some information.

A.—We do not know the details of any such process, and in every case such processes are covered by patents.

Q.—J. M. writes: Will you please tell me what makes my prints crack when they are burnished? They look as though they have been crushed and then straightened out again.

A.—You probably let the prints get too dry before you burnish them.

Q.—C. H. H. writes: Will you answer the following: The cause of these yellow streaks over the paper after sensitizing. The paper is not scorched while drying, which I have proven. The cause of measly prints after floating two minutes on a 50-grain bath neutral fumed twenty to thirty minutes, paper well dried before placing on the negative. Also the cause of silver not coming out in wash water, rain water at that, and use a drachm of acetic acid until they become slightly red?

A.—The streaks are due to scum on the silvering bath. Draw a strip of clean blotting paper over the surface of the bath before floating paper. Measly prints are probably the result of using the paper too dry. Keeping in a damp room over night is a good plan. If you use rain water that is clean it will become only slightly milky when you wash the prints. It is impure water that precipitates the silver.

Q.—R. M. H. writes: Please give me, through the columns of the next BULLETIN, what you consider the best formula for silver and toning baths. I use Three Crown paper. My prints look pale. My negatives are good usually.

A.—Use a 45-grain bath of silver nitrate. Fume the paper twenty to thirty minutes, and tone in a gold bath containing 2 grains of gold chloride in 8 ounces of water, with 10 grains of salt and enough sodium bicarbonate to make it turn red litmus paper decidedly blue. Print deeply until shadows are obscured. They tone much lighter than you print them.

Views Caught with the Drop Shutter.

THEO. C. MARCEAU, the well known photographer of Cincinnati, O., and Indianapolis, Ind., called upon us a few days ago, previous to his departure for an extended tour through Europe and the Orient. Mr. Marceau intends traveling abroad about seven months, taking in the principal cities of interest. He is one of the youngest and most successful

photographers in this country, and his many friends wish him *bon voyage*.

THE amateur photographer must have the best camera that can be made, and it is largely owing to their pressure that American manufacturers have awakened to the fact that they must turn out a camera in finish and design inferior to none. As a result they are now combining the advantages of the English cameras with the good points of the American make, and the result is something better at each effort.

The English cameras were needlessly bulky and heavy, but a great good point in their favor is the front focus advantage. That is, the front part of the camera slides back and forth on the bed instead of back and forth on the ground-glass end. It is thus easy to handle, and the ground-glass end being stationary, the operator does not have to move his head back and forth constantly. It is worked by means of a rack and pinion movement. An excellent example of the combination of the advantages of the two cameras is seen in the Phantom camera. This has the reversible movement of Novelette style, with the English advantage.—*New York Times*.

PHOTOGRAPHING AT NIGHT.—In response to invitations a large number of our citizens gathered at Davis' gallery last evening to witness practical demonstrations of making photographic sittings at night, by what is generally known as "the flash-light process"—something comparatively new to our public. After a few brief preliminary remarks regarding the rapid progress of photography, Mr.

Davis proceeded to make a number of "sittings," and to the amazement and wonder of the spectators, negatives were made in the *thirtieth part of a second*, and as they were developed immediately and passed around for examination they were shown to possess the finest technical qualities of the best day-light work. The demonstrations over, Mr. Davis explained to his audience how available this process was for photographing all manner of evening gatherings, and that for usual portrait work his gallery would be open for sittings every night until 10 o'clock.—*Charleston Daily Star* (W. Va.).

EDSALL'S IMPROVEMENTS.—Among the many improvements to be made in the near future on our noted "125th street," are those of Edsall, the photographer, who has secured a long lease of the building adjoining the one he now occupies at 248 West 125th street, to which another story will be added and joined to his present atelier, and when completed will be one of the largest and most perfect in the city, having a direct north light, indispensable to the production of fine photographic effects. Mr. Edsall is considered one of the leading photographers of the city. His work is noted for its artistic effect and finish. No agents are employed to sell tickets, and there is no club work made at his establishment, he claiming that more satisfaction is given and better work obtained when parties deal direct with the gallery. The fact of Mr. Edsall's enlarging his establishment proves his success, and when his improvements are made up-town, residents can say that they have as fine a gallery in Harlem as there is in the city.

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NEGATIVE ON ANTHONY'S CLIMAX NEGATIVE FILMS.

PRINTED ON N. P. A. EXTRA BRILLIANT ALBUMEN PAPER.

SOUTH DOWN SHEEP, CENTRAL PARK, NEW YORK.

BY

PROF. HENRY J. NEWTON.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

JUNE 8, 1889.

Vol. XX.—No. 11.

THE SEMI-CENTENNIAL OF PHOTOGRAPHY.

THERE is no doubt that the coming meeting of the Photographers' Association of America, to be held in Boston in August next, will be an event to be remembered by all who have the good fortune to participate in it. We hear from all sides that large numbers of photographers are preparing to exhibit and that there will be a very animated competition for the prizes.

OUR readers must not forget the date of the meeting—August 6th to 9th inclusive. There is no time to lose in the matter of preparing exhibits. Time passes very rapidly during these bright, busy days, and every moment should be utilized in making ready for the competition. It should also be remembered that this competition is open to all; that every photographer has a chance to obtain some reward for his efforts to excel in the art. It is very foolish to think that because you may be only able to show small work that therefore it is not worth while to compete. Every earnest effort to excel is bound to have its reward, for if a prize is not won, the effort itself must necessarily make you better.

WE are sure that the Executive Committee of the Association will manage everything so as to secure the greatest amount of benefit to all the members. It is well to remember that these meetings are a combination of social as well as intellectual reunion, and every effort should be made to keep this in mind in arranging the programme. We still think that the advice we have given on former occasions, to have the meetings for the reading and discussion of papers in the evening, is worth trying; and we understand that this idea will be carried out at Boston. By this means we shall have the opportunity for members to discuss papers and practical subjects without being annoyed by those whose inclinations tend to merely viewing the pictures and apparatus, and who simply walk in and out of the meeting-room without any regard to the subject in hand. These latter should be given every opportunity to gratify their wishes; but it should also be remembered that others like to listen to the discussion of topics of interest in the art without having the annoyance of hearing a pair of squeaking shoes drown part of an interesting sentence from a speaker. Every member has a right to do whatever pleases him, provided he does not infringe the same right in his fellow members.

We sincerely hope that some effort will be made to have an historical collection of both apparatus and pictures of the early days of photography, and we think a special committee should have charge of this part of the exhibition. It will be extremely interesting to see the apparatus and work of the early workers in the art, and we feel thoroughly satisfied that such a collection would be greatly appreciated by the members.

It would be also very interesting if one evening could be devoted to historical reminiscences by some of the veterans of the art. These men cannot always be with us, and it would prove not only entertaining but profitable to the younger members of the Association to hear of the rise and progress of photography from the lips of those who have taken an active part in its development.

Another point that should never be forgotten is that these annual meetings are to many of the members vacation times, and they like to have the opportunity of meeting their fellow-members and making excursions with them. It is, therefore, important that an opportunity should be given for a grand excursion and good time. We believe that such a step is contemplated; but unfortunately the day after the closing of the exhibition is the time set down for it. We think this is a great mistake, for our good friends in the manufacturers' departments will then be forced to forego the pleasure of the excursion in order to repack their goods before returning home. We think the afternoon of Thursday would be a better time, and close the exhibition on Saturday at noon instead of Friday afternoon, as proposed.

We call attention to the letters of *President* McMichael, *Vice-President* Hastings and *Secretary* Scott on other pages of the BULLETIN, and urge all our readers to make an effort to go to Boston in August next. Go, and take some active part in the meeting, and you will never regret the time so spent.

EDITORIAL NOTES.

THERE will be an International Congress of photographers held in Paris during the progress of the Exposition. During the Congress it is proposed to consider the following questions :

1. The introduction of a fixed unit of light in photography.
2. Uniformity in measuring the focal length of lenses.
3. Uniformity in indicating the photometric effect of lens diaphragms.
4. Uniformity in the mode of measuring the time of admission of light by shutters.
5. Uniform and easy adapters for different lenses on various cameras.
6. Uniformity in the dimensions of plates.
7. Unity in the expression of photographic formulas.
8. Unity in naming photographic processes.
9. Custom-house formalities for the circulation of sensitive preparations.
10. Protection of artistic rights in photographic work.

The above questions are those proposed by the Committee of Organization of the Congress. But other questions will be considered, if sent to the Secretary, S. Pector, 9 Rue Lincoln, Paris, fifteen days before the opening of the Congress, which convenes from August 6th to 17th next. Two additional questions have

already been proposed—uniformity in estimating luminous intensity in photographic operations, and unity in the method of determining the sensitiveness of photographic preparations. If some reasonable agreement can be obtained in the discussion of these questions we shall be exceedingly glad, and photography will be greatly assisted in its advancement.

THE American authors who visited Washington during the discussion of the question of International Copyright in March, 1888, and were received at the White House, have just presented Mrs. Cleveland with a handsome album, as a souvenir of their visit. The leaves are of parchment in a fine binding, and each author has written his autograph, together with a short piece of prose or verse. The collection was made by Dr. Edward Eggleston, of the American Copyright League.

THE Society of Amateur Photographers of New York gave a very handsome lantern exhibition in Chickering Hall on May 28th, in aid of the Memorial Arch fund. The opening address was made by the Reverend Robert Collyer, and Mr. J. Wells Champney described the pictures as they were projected on the screen. The display consisted of the instantaneous views caught, mostly by the detective camera, during the three days of celebration of the Centennial in New York City. It was a very wonderful exhibition of the skill of modern amateurs, and also of the marvelous perfection of modern photographic apparatus and dry plates. It is out of the question to give in words any idea of these pictures, and we hope that the Society will make arrangements to circulate the collection around the country, when we advise our readers not to lose the opportunity to see them.

FOLLOWING the example of Boston Camera Club, the St. Louis amateurs are hard at work with a view to preparing a set of lantern slides illustrating their city. The set will be called "Pictorial St. Louis," and will be from negatives made by the members of the St. Louis Camera Club. Father Charropin, of the St. Louis University, has consented to make the slides, by request, in order to secure uniformity.

We know of no better work than these slides illustrating the various cities of the Union, that amateur photographers can undertake. It not only gives them an object in working, but enables strangers to appreciate places that are often known to them only by name.

THE Excursion Committee of the Photographic Department of the Brooklyn Institute have arranged for the following excursions: June 8th, Flatbush; material—old Dutch houses. June 22, Irvington-on-Hudson; material—Irving's home, Church at Sleepy Hollow, Irving's grave, etc. July 6th, Bay Ridge and Fort Hamilton; material—shore and harbor views, Forts Lafayette and Hamiliton. July 20th, Harlem River; material—river views, bridges, Fort George, etc.

MR. S. R. STODDARD, of Glens Falls, sends us a picture of the arch at the foot of Fifth avenue, New York, taken Wednesday evening, May 1st, by the magnesium flash-light. This is the first picture of the kind that has come to our notice, and is remarkably good when we remember the size of the object and the conditions. It is certainly interesting as an experimental effort. There is

considerable detail in the lighter portions of the arch, but the people grouped around are not so good, although in these cases there is much good definition in the faces.

[By our Special Correspondent.]

ENGLISH NOTES.

AFTER a long (though not severe) winter and a late spring, vegetation has "come with a rush," owing to the warm rain and sun of the latter part of April, and we are landed at once into the "photographic season," with all its capabilities.

For future years it may be as well to make a note, not to let slip the few precious days when the leaves are small. This is the time—early spring—when country buildings, churches, castles, farm-houses and the like are most advantageously photographed. The trees are just sufficiently clothed not to look bare, and yet they do not hide architectural details with the mass of greenery which they assume later on.

Of course there has been a great rummaging out of cameras, etc., and cleaning of dark rooms. The amateur has awakened, and you meet him on the war-path by the hundred every Saturday afternoon; while the desire to develop and print from his negatives accounts for the thinning of the congregations in our churches on Sundays. And the heart of the professional rejoiceth in the sunshine. He replenisheth his show-case and hangeth it up cheerily; the canvasser goeth forth into the highways and byeways, while the trusty "doorsman" striveth with renewed vigor to inveigle the passers-by to "come and be photographed by our new instantaneous process!"

And so the photographic world is alive again, and we wonder how many plates will be exposed between April 1st (ominous date!) and September 31st; between which dates I reckon the ordinary "photographic season" in these islands to extend, although the first of May will this year (owing to the late spring) be nearer the mark for the general crowd.

I lately paid a visit to what is perhaps now the most extensive dry plate manufactory in England—that of R. W. Thomas & Co., at Thornton Heath, near London. Gradually the "small" dry plate works have died or are dying out, or are being "absorbed," and the trade in England now lies practically in the hands of half a dozen firms. By recent alterations at Messrs. Thomas' the works have been made capable of coating five thousand dozen quarter-plates per day. All the emulsion is made or rather purified by means of a separator, which is a silver cylinder, into which the cooked emulsion is placed, and which is then caused to rotate at a tremendous speed. By centrifugal force the molecules of silver bromide are forced outward to the sides of the silver cylinder, to which they adhere; while the liquid, partly decomposed gelatine, is left in the middle. The latter is then poured off, and the silver bromide scraped off the sides and incorporated in fresh gelatine, being then ready to be used for coating the glass plates.

Messrs. Thomas' able manager, Mr. J. T. Sandell, has recently patented a new system of plate packing, which is now on its trial. Being sensible that atmospheric air is the chief cause of the "going bad" of ordinary gelatine dry plates when they are kept for a year or more, Mr. Sandell places his plates in pairs, film to film, and prevents all chance of side movement by the pressure of corrugated paper.

In my own work I now very largely use plates with ground glass backs. The ground glass prevents halation to a great extent, and it is very convenient, for working on with brush and pencil to secure broad effects.

I see that Messrs. Anthony have lately published an American edition of Mr. Jerome Harrison's new text-book for beginners. Although this work has been published so short a time, it has had and is having a very large sale in this country.

Everybody is, of course, going to Paris this summer; and it appears that "everybody" has resolved to take a detective camera with him. The Eiffel Tower will, I imagine, have to be taken "in sections," in the same way as the California pine, to look to the top of which required "two men and a boy, the one to begin where the other left off." But the existence of the detective camera is dawning upon even the average official (and French officials are somewhat short of temper), and as the right of photographing within the exhibition and its grounds has to be "paid for," I should advise our detective friends to be careful; for any average idiot could tell what most of them are up to as they fumble over their "adjustments," and peer into their finders.

The number of photographic societies continues to increase steadily and rapidly, and for the British Isles now amounts to about 110. The ingenuity of the editors of our photographic periodicals is taxed to find space for the accounts of the meetings of these societies, while it is impossible to insert half the papers which are read. To remedy this state of things a special periodical named "The Photographic Societies Reporter" (monthly, price fourpence) has been originated in connection with the "Amateur Photographer." The editors are Messrs. Lyonel Clark and Hastings, and it is published by Hazell, Watson & Viney, of 52 Long Acre, London. The first number is for January of the current year.

In the ordinary method of intensification by means of bichloride of mercury followed by ammonia, one of the "troubles" is the thorough washing required after bleaching with the mercury. This may be shortened by well rinsing the negative, and then soaking it for five minutes in a weak solution (1 ounce to the pint) of ammonium chloride. After this a wash of ten minutes in running water will be sufficient.

The principle of applying the mountant to the card (which is then dried and sold ready for use) is now also applied to albums. It is in that case only necessary to damp the photograph and press it down upon the paper. But all these "time-saving" processes have their drawbacks, and without more experience I should be inclined to fear that the pages of the album might "stick" in damp countries and in damp weather. The mountant also imparts a somewhat spotty gloss to the surface.

The results of recent exhibitions go to show that the man who wants the medals must aim at two things. In the first place his work must be "large and black." Although there are notable exceptions, yet it is none the less true that pictures of less than whole-plate size ($8\frac{1}{2} \times 6\frac{1}{2}$ inches) look insignificant on the walls of an exhibition. And he should print in platinotype, for that is the way to get "artistic-looking" results. In the second place, and mainly, a picture, to get a prize nowadays, should possess something more than perfect manipulation. The unconventional is greatly sought after, and such subjects as a group of rearing horses, or Gipsies straggling over a wild moorland, are placed before the

most perfect representations of the famous buildings and landscapes which have been "photographed to death" during the last half century. I note, too, that sharpness of focus is not greatly admired; indeed the best judges prefer the "diffusion of focus" principle, and the lenses made by Dallmeyer, which admit of this (by unscrewing the back combination a turn or two), are much sought after. The new rectilinear landscape lens of the same maker is frankly recommended by Dr. Emerson in his new book, "Naturalistic Photography," and in a private letter I see the Doctor recommends the use of a lens *one size larger than the plate*—that is, we should employ a 10 x 8 lens when carrying a whole-plate camera, and so on. The greater length of focus thereby secured greatly improves the perspective of the picture; or rather, the relation between near and distant objects.

New patterns in detective cameras continue to come out daily. The last I have seen is a cheap German instrument which contains a piece of sponge. It is intended that this should be dipped in ammonia, the fumes of which, falling upon the plate or paper during its exposure, would (it is supposed by the inventor) render the film more sensitive. But as a means for the production of "fog" the plan appears unrivaled to

TALBOT ARCHER.

INSTANTANEOUS MARINE PICTURES.

BY W. P. RIDGE.

Of the thousands of instantaneous views made in our harbor, how many of them are worthy of the name of picture! Single vessels, broad side on, going at the alleged speed of 20 miles, are certainly interesting as photographic feats or as portraits, but they are usually very far from being pleasant compositions. Spring is here, and with it pleasant days for snap-shutter work. Too many men are already discouraged at the want of picturesque effect with instantaneous marine work. Some have tried the experiment of a tug at \$50 per day and have not been satisfied with the result.

This article is for the purpose of suggesting a better way. In general, marine compositions are not to be had by going for them. They will, however, come to us if we know where to wait for them. There are two places on the west side of New York City where for an hour or two every morning pictures are made almost every minute. At the foot of West 23d street, at 9 o'clock in the morning, one can, two mornings out of three, find the following combinations: One of the Iron steamboats backing out of her pier; another boat of the same line crossing astern to come into the dock, while the bow of the day boat for Albany (the "New York" or the "Albany") can be brought into one side of the picture. Usually there are many other boats in the field of view. Lighters, tug-boats and barges are usually in the field of view.

Wait a minute or two after nine, and the day boat will be swinging out and be foreshortened in the center of the picture, while the other boats have changed places. If the tide is right, a ferry boat will also come into this marine spectacle.

The ends of the Erie ferry piers are two good positions. The Iron Steamboat dock also affords a fine location. The Albany day boat dock and also the dock above might give good pictures. But the amateur who wishes to get the picture must be on the spot for one or two mornings, and must be ready for work

at least ten minutes before nine and should not leave till at least fifteen minutes after. During this twenty or twenty-five minutes there may be a dozen opportunities if the morning is a favorable one.

Another rich field is found at the foot of Franklin street. At this place the Dock Department is filling in, and there are no end of quaint combinations of carts and Italians for foregrounds, while steamers are coming and going just outside. This has been a particularly interesting spot because the work was constantly altering the locality itself. In six months the whole spot will be changed; the pavement down, and sheds cut off all the value of the place for the photographer. For months past strange crafts of all kinds were to be found around the temporary wharves of this basin. The best time is from 8 to 10 A.M. It is in its prime about nine in the morning. With a good lens this spot has the advantage of furnishing a fine and interesting foreground for any distant object that might be within reach. Many of the derricks make fine pictures by themselves when a good foreground is selected.

In general, where the Dock Department are at work building new piers there are good things to be had with the hand camera. In all cases, however, due regard must be had to the time of day. On the East River the afternoon is the most promising on general principles. On the North River there is little to be had after 11 o'clock. The sun is then so high and so far south that, as a rule, the best efforts are lost.

The beginners ought to keep in mind the fact that broadside views of steamers and sailing vessels are not as satisfactory as others. Ships, barks and other "square rigged" vessels are each year becoming less common. Each picture of their decks and spars, with all the queer, intricate and interesting tracery of rigging which they present, becomes historically more and more valuable as time passes. Such pictures are rare, yet at the present time they are by no means difficult to obtain. There are usually square-rigged vessels lying just below the Pavonia ferry on the Jersey side. The California clipper ships come into the East River and unload and load at the docks next to the Grand Street ferry houses, on the south. There are also many square-rigged vessels at the pier next but one below the Brooklyn Bridge. At the dry docks, five or six blocks above the Bridge, there are usually collections of vessels which give good opportunities to the hand camera.

On the East River the morning is a bad time, because the sun is rather too much on the river side and because of the haze and smoke from the city. The camera may, therefore, go to Jersey or the North River in the morning, where the air is clear and the light comes from the best direction, and take the East River for the afternoon. Ropes and rigging and ships' hulls are rather dark as a rule, and it is best to have them well lighted if a short exposure is desired.

On the East River a ship's bowsprit may often be found reaching half-way across South street, the vessel herself lying with her bow almost against the dock. A view looking north (away from the sun), bringing in this spar, with its ropes and chains, and taking in a portion of the ship itself, can often be found which will be a picture worthy of a painter. Such a scene, with the busy street, a glimpse of the Bridge, and the quaint intrusion of the vessel, makes a view of which no photographer need be ashamed even among artists.

Rather short focus lenses are best for this work. A wide angle which will cover a 5 x 6 plate is just the thing so far as covering power is required. Great

speed of shutter is not needed. A common drop, without a band or spring to hasten it, will answer very well. At the present time there are at least three points below Fulton street on South street where such compositions can be found. On the ends of the piers nice groups are constantly to be found. They are very effective on account of the background of the vessels and the picturesque foregrounds.

There are a great many photographs shown which are classed as marines which are merely groups, with a steering wheel or a cabin door for a background. A boat or a vessel is suggested, but the group is horribly aggressive and there is no foreground to speak of. There is a marine flavor to the subject, and that's all. As a rule, these subjects are not worth a plate.

Sloops, schooners, catboats and lighters do not, as a rule, have detail enough to make good pictures alone. To utilize them a number must be caught at once. For this the dock at Washington Market affords fine opportunities. For canal boats, go down to the canal boat basin, just east of the Battery. It used to be at Coenties slip. The place was formerly accessible on both sides, so that good effects might be obtained in both morning and afternoon. On the days when the tows are made up for Albany there are many fine groupings of boats and tugs. From 1 o'clock onward will give the best results. Along toward dusk the tows are completed, and the great paddle-wheel boats pull the long lines of boats around the Battery and up the river. Unfortunately, we do not know on what days of the week the tows are made up.

When the Wilson or Atlas line steamers are loading at the foot of 24th, 25th and 26th streets, there are fine groups of canal boats, lighters and elevators to be had in the morning. From 8.30 to 10 o'clock the light will be the best on the average day. Now and then the afternoon light gives good results.

In many of the locations which have been named it is possible to get foregrounds which will give the composition a balance and completeness which is always lacking where a dreary waste of water fills the lower half of the picture.

The marine picture has a large proportion of its interest in the multitude of strange detail. The photograph will be the most pleasing which is fullest of this detail. Very often, when composition and light and shadow are not all that could be desired pictorially, the richness of details can be made to give an interest to the photograph.

Since writing, another corner of the water front has been brought to my notice. It is the stretch of shore from 50th street northward on the Hudson. At 51st street there is a long, fine dock, and below it the Dock Department are preparing for work. Above there are several piers where interesting combinations of lighters, derricks, etc., are constantly occurring. The region is rich, and well worth exploration at almost any time of the day.

THE DEVELOPMENT OF THE DETECTIVE CAMERA.

By ALEXANDER BLACK, *Brooklyn Institute.*

THE primary principle of the Detective Camera is its portability. Its original *raison d'être* was its freedom from the tripod. An operative camera without a tripod was, of course, impossible in the time of slow plate. A portable camera did, indeed, anticipate the quick plates, for Mr. Brainerd, at least, visited the Centennial Exposition in 1876 with a small legless camera, with which he man-

aged to break the rules by taking pictures here and there without a permit ; but this portable camera required a rest and time exposure. With the advent of the quick plate the emancipation was complete. This emancipation was not accomplished without skeptical opposition. Mr. Schmid, of Brooklyn, who first patented a detective camera, was confidently assured that the idea was infeasible. There must at least, he was told, be a rod or upright of some kind upon which the box might be rested while focusing was being accomplished. When Captain Ericsson proposed to propel vessels with a screw in the stern, the experts asked how under heaven he expected to steer the craft. A boat propelled from the stern could not, they said, be steered from the stern. The experts were, of course, mistaken. So were the photographic experts who caviled about the focus. The focus is merely a matter of arithmetic; and just as the quick plate and automatic shutter banished the tripod, the lever and indicator removed the necessity for ground glass and cloth. These two primary principles being settled, there came a less vital but highly important element in the "finder"—a camera-obscura attachment which revealed to the operator the scope of the lens. This finder bears precisely the same relation to the camera that the sight bears to the rifle. It is not used in rapid skirmishing. No operator could be considered fully skilled who was dependent upon the finder in rapid or stealthy work. An operator dependent upon his finder would be continually at a disadvantage. But while it is not invariably brought into play, the finder is a necessary adjunct, and we should as soon think of leaving it off the camera as we should think of leaving the sight off the rifle.

Upon the basis of these three elements—the shutter, the focusing lever and the finder—the modern detective camera has grown. Step by step it has developed from a crude and primitive beginning, to a mature, exact and more or less perfect instrument. In many respects this growth has been remarkably slow—slow for an invention of American origin. Perhaps this was because for a long time the portable camera was looked upon as a pretty toy scarcely entitled to scientific attention. The immense significance and utility of the camera were long overlooked, under the supposition that serious and particularly artistic work could be done with the tripod camera only. Since it was decided that the detective had come to stay some interesting scientific developments have been made in its construction. Some of the latest types are really worthy of admiration. But there is still much to be done.

It has always struck me as curious in the matter of photographic apparatus that so many good ideas should be wretchedly executed, and that so much good workmanship should be lavished upon mechanism that is unreasonably awkward. I have never heard this phenomenon satisfactorily explained.


In its best forms the detective of to-day is a beautiful machine, capable of doing work of a high degree of perfection, and imposing upon the operator the minimum of inconvenience. As compared with the tripod camera, the portable camera, in its better forms, has absolutely no limitation but that of size, and this is neither an artistic nor a scientific limitation. It is a limitation in the size of the immediate print, but enlargement somewhat modifies this deficiency. Certainly there are portable cameras so small as to seriously impair their usefulness. The quarter-plate, $3\frac{1}{4} \times 4\frac{1}{4}$, should, I think, be the minimum of size. The 4×5 plate seems to me to be the ideal size, small enough to be portable and large enough to be practical. A 4×5 plate allows for some reduction in making lan-

tern slides, and this is desirable, even with perfectly sharp negatives. Slides made by contact are relatively deficient in crispness and brilliancy. Contact slides shown in the group are often very satisfactory, but when shown with slides made by reduction the strain is severe.

All perfect portable cameras are arranged for time exposure, which removes any limitation imposed by the speed of exposure. It has been very illogically urged that a camera made for "detective" work should be built for that work only. It is true that the primary significance of the instrument should not be forgotten, but cannot be improper to fit a camera for all the work it can possibly do. There are a number of highly important reasons why the detective should be capable of use in time work at short notice. When taken on a journey a camera should be ready for any emergency. The detective should, indeed, be the universal camera in the matter of equipment. And this does not necessarily imply any deficiency in the arrangement of its strictly portable apparatus.

In other words, the portable camera begins where the older camera leaves off. It begins with all the capabilities of the tripod camera, and adds to this capacity many functions of which the older camera is incapable. It is the camera of the future. It has led the way in many of those directions in which the tripod camera is bound to follow. The idea of the finder and of the focusing lever or screw have already appeared in the conventional apparatus. The detective is the pioneer. It has made us impatient with all except the most convenient forms of camera, whether worked with or without the tripod.

Yet the best of portable cameras is still far from perfect. The ideal detective camera will be a greater triumph of mechanism than any we have yet seen. It will have a certain number of features which we may conjecturally enumerate. Some of these features have already been realized, in fact. It will have two or more lenses—long and short focus—within the box, and quickly interchangeable. It will have a quickly operative focusing adjustment for both lenses, and a simple system of stops quickly changed from the outside of the box. It will have a shutter with great versatility of speed and a changeable aperture for different conditions of exposure, operated between the discs of the lens or behind both, with a spring that will never vary in strength. It will have a substitute for glass plates in holders, yet better than the modern paper or film. It will carry sensitive surfaces for at least a dozen negatives, and the more the merrier. It will change the position of these sensitive surfaces without opening the box at any point to the light. The camera of the future will at least have these features, and all these operations will be effected from the outside of the box by mechanism not discernible to the passing glance. The camera itself will be inconspicuous in form, of light weight and moderate price.

[Written for "*International Annual*."] 

A PLEA FOR THE FIVE-BY-FOUR CAMERA.

By PROFESSOR STEGGALL, of *University College, Dundee.*

THERE are many objections, I think, to the growing habit of using very small cameras (of the detective class chiefly) for general purposes. The objects which these cameras are meant to fulfill are sufficiently important to give plenty of scope for their legitimate use; but when a small camera with a plate, say, 2 inches square, which is admirably suited for instantaneous work, is pressed into

employment as a landscape instrument, the result is not satisfactory. In fact, even the very popular quarter plate is somewhat small and otherwise objectionable, for various reasons. A very small picture is difficult to see at all; but it labors under a worse defect than this: it has to be viewed at a very short distance—in fact, too close for most people's sight. Besides this, the taking of these photographs is so easy and so cheap, the manipulation so trifling in its demands, that little care is generally exercised in their development, printing, etc. Of course they make good enlargement subjects; and *cartes de visite* can be easily taken. The success of this kind of picture can generally be learnt by moderate attention to the remarks of candid friends.

It would be easy to develop further such objections to the popular quarter plate, while the half plate, for a long day, is burdensome. As a suitable camera I would strongly urge the 5 x 4 size. In the first place, its pictures are, though small, yet large enough to be capable of very artistic working and mounting; in the second place, they can be marked or vignetted so as to produce excellent cabinet prints; and in the third place, the size of the camera is the merest trifle over that of the quarter plate; both being square, there is only the difference of three-quarters of an inch.

For several years I have used this size regularly, with four dark slides, and four inner carriers (in case of need) for quarter plates. A lens made for a half plate camera takes good instantaneous pictures, and can also be used as a single lens. My little camera, which is quite light, has a bellows extending to 13 inches.

Of course most amateurs will want something fairly portable, yet a good deal larger than their smallest instrument. A whole plate is, in my opinion, the most suitable size; and here again the rectilinear half plate lens, if of good quality, can be used with a small stop, or as a single landscape lens with the whole plate camera. Last of all, for special work a 10 x 12 or 12 x 15 forms a suitable termination for most amateurs. This camera can have its lens adapted to the whole plate front, for instantaneous work, with full aperture. The general equipment, then, of quarter plate, half plate and larger camera, is in my case replaced by a 5 x 4 whole plate and 10 x 12. Two lenses are sufficient for most of the purposes of an amateur; and certainly since I discarded my half plate and gave away my 7½ by 5, I have never regretted the change.

To those who do not care to be troubled with more than one portable camera I should advise the small 5 x 4, with a lens of good focal length—say 7 inches. So few makers encourage this size, and so few amateurs apparently try it, that I have risked the commonplace in sending these simple notes.

[Written for "International Annual."]

ORTHOCHROMATICS AND APOCHROMATICS IN PHOTO-MICROGRAPHY.

BY E. C. BOUSFIELD.

THE range of application of photo-micrography has been enormously increased of late by the two appliances which furnish the title of this note; and it may not be amiss to devote a few lines to a short discussion upon them, especially as they both have, in a way, the same object, viz., the clearing away of color difficulties from the path of the photographer.

The conditions requiring the use of orthochromatic plates in photo-micrographic work are essentially different from those which present themselves

in the reproduction of even very difficult objects, such as an oil-painting with light blues and dark reds, in ordinary practice. There is no portion of such an oil-painting which does not reflect all the colors of the spectrum, in varying degrees, it is true, but still to such an extent as to be capable of impressing, with prolonged exposure, even an ordinary plate of "17 Warnerke."

The photo-micrographer, however, who has to reproduce such an object as, say, an insect with clear wings and a brown body, finds, on examination by the spectroscope, that whilst the former produce no effect upon the spectrum, the latter stops out the whole of the rays down to the extreme orange, and it is thus by a light in which the most sensitive plates might safely be worked that he has to photograph one portion of the object, whilst the full blaze of light is passing through another portion, and so, to borrow the expressive French term, "burning" that portion of the plate on which its image should be impressed. When preparing for publication my "Guide to the Science of Photo-micrography," I spent a good deal of time on this matter, experimenting with screens of various colors, endeavoring to find one which should sufficiently lower the actinic power of the light which passed through the colorless parts, without altogether blocking out the darker ones. Three were soon singled out, dark blue, signal green and yellow, and on ordinary plates, with the first mentioned, I found that a moderate degree of success could be obtained, the others acting in a similar way, but not so satisfactorily. It was soon evident that what was required was to eliminate actinic effect, as opposed to visual, altogether—that the objects must be photographed by a light of such a character as to reduce all portions to shades of the same color, and the tint which yielded the best results was a deep orange (the color supplied by Warnerke with his orthochromatic plates as originally manufactured). With such a tint the use of ordinary plates, except by direct sunshine, would be almost hopeless, and indeed I have not hitherto been able to obtain any color-sensitized ones which fully satisfy the requirements of such a position. Dixon's promised splendidly, and had I been able to keep up the supply my difficulties would have been overcome; but alas! trade jealousy proved too much for Dixon, and the very best orthochromatic plates which have ever been made are no longer in the market. Latterly I have taken to the use of a mixture of erythrosin and cyanin, and as some of my fellow laborers may like to try it, I append the formula which has yielded the best results in my own hands.

I.—DYE SOLUTION.

Cyanin.....	8 grains.
Erythrosin.....	8 "
Absolute alcohol.....	3 drams.
Distilled water.....	5 "

Keep in the dark.

To make the color sensitizing bath, take—

Dye solution.....	1 dram.
Ammonia, ten per cent.....	1 ounce.
Distilled water.....	8 ounces.

The plates are bathed for two minutes, drained on edge, and dried in the dark. I believe it to be advantageous to warm the air which passes through the drying box to a temperature not exceeding 80 degrees, but care must of course be taken to exclude the entrance of the products of combustion. With these

plates and suitable screen I believe there are few objects whose color, if they transmit any light at all, will prevent their reproduction ; but the screen must be so arranged as to reproduce upon the plate the visual intensities of the respective portions of the object. Too dark a screen will destroy contrast altogether, too light a one will fail to give the desired effect, and it is in the choice of a screen that the skill of the photo-micrographer will be chiefly shown.

To those who prepare objects with the view of reproducing them by photography, I would strongly recommend iodine-green, and Grenacher's borax carmine, or picro-carmine, as staining fluids ; many of the difficulties which necessitate the use of orthochromatic plates may thus be avoided. But where Nature has chosen her own stains we must do the best we can, and experience and patience in the time of exposure will furnish the best guide. As to the screens, I am strongly in favor of the use of solutions either of chromic acid or bichromate of potash in a glass cell with parallel sides. The actinic effect of solutions of definite strengths can easily be gauged by means of Warnerke's sensitometer screen, exposed in the camera over an orthochromatized plate, and much time and trouble may be saved by the adoption of this method. Solutions of various strengths can be kept easily, and rapidly interchanged as may seem necessary.

The use of apochromatic lenses has led to the adoption of a much higher standard, as regards both sharpness and contrast, in photo-micrographic practice, and no negative would now be considered satisfactory, by the best judges at any rate, which did not admit of the production from it of a positive suitable for lantern work. Lantern slides form so convenient a method of illustrating lectures to large audiences that their manufacture is becoming a very important part of the photographer's work, and inasmuch as, so far at least as regards photo-micrography, the negatives used must be very nearly perfect, in clearness, color and density, to give the best results, a distinct advance in the quality of prints shown at exhibitions may be looked for. In my own experience I find that many negatives which yield excellent silver prints fail utterly when applied to lantern work, and unfortunately it is not always possible to judge beforehand. My own impression, confirmed by my friend Mr. Pringle, is that bromide paper furnishes a good test of negatives in this respect. The whites in both cases must be absolutely clear when all detail is well out. The absolute sharpness and freedom from color fringes of the images yielded by the apochromatic objectives, are important means toward obtaining the sharpness required for so enormous a magnification as is used when the image of a microscopic object is thrown upon a 10, 15 or 20-foot square screen. The great point to be aimed at in photo-micrographic negatives is that very chalkiness and hardness which are to be avoided in general photographic work, and everything depends upon exactly the right amount of exposure being allowed. The developer, provided it be fairly normal, is a matter of indifference. It should err, if at all, in having a full quantum of restrainer; but if the exposure be wrong, a good lantern slide can never be made from the resulting negative.

"WILL you vote for my bill?" inquired the lobbyist of the legislator. "No, sir," replied the latter; "your bill is a swindle." "Why, man, you must have the wrong bill in mind. I mean this fifty-dollar bill!" "Well, this appears to be a good bill," said the legislator, after examining it critically. "I'll vote for it, of course."

MULTA RENASCENTUR QUÆ JAM CECIDERE.

This is the true Magic Art, by which years ago and now forever spirits will be made to appear and be photographed :

Abracadabra! On one side of the ground glass place slightly out of focus a being dressed in white, as ghosts always make their appearance (black background, of course). Coat a plate, $\text{K}\alpha\lambda$ —sensitize, C —expose, O

—develop, O —strongly intensify, O —muriate—wash slightly and flow on

the negative a dilute solution of *aqua fortis* H_2SO_4 with a little *lana philosophica*, which should be for five minutes allowed to act. This done, expose the negative to a bright sunshine, placing when it is dry a white paper behind, and let



act for many hours. Then immerse the plate in a weak solution of

com. Kalia $\text{K}\alpha\text{O}$ and when the film becomes loose wash it off without rubbing

and let dry. Nothing on the glass! It is clean; it is quite clear. Keep it for use. 3, 7, 13 are the magic numbers of plates to be prepared. They must be

thus marked on the back S
 $\text{S}+\text{S}$, and on the front hZ ; which are cabalistic figures. Here comes a—customer! I suppose you are a sorcerer. Show to

him this clear and clean glass, and in his presence coat it with $\text{K}\alpha\lambda$, sensitize

it, and when ready let him (the customer) be seated near a table, upon which you place a skull, an open Chaldaean *grimoire* and a sand-glass; a black cat, also, if you have one at hand. Draw, then, on the floor my cabalistic seal, and make the incantation, *Kèphalè! Argyros!! Hydôr!!!* and shoot! Now behold! on developing the negative the sitter's likeness and that of the evoked spirit or spirits—for there might be a lot of them—will together appear!!!



Heg. 1266.

AABAM ABADIR.



—Translated from "*Ghâiat-el-Kâkim*."

N. B.—This photo-magic should not be mistaken for the humbug process on gelatine plates imagined by those not initiated to the mysteries of the Black Art; for the spirits they pretend to evoke are *not* spirits, but reproductions—and very bad ones, too—of photographs vignetted or cut in various shapes and copied in the ordinary manner. From the negatives transparencies are made and the portraits isolated by covering the background with Gihon's opaque. Then, before or after exposure, the gelatine plates are placed in contact with the transparencies, and exposed to the light of a gas or petroleum lamp in the dark room, whereby the picture of the bogus spirit appears with that of the sitter on developing.

Other means have been devised to produce the same illusion, (?) and always without even taking the trouble of reducing or enlarging the portraits of the

spirit to a proper size, the head being sometimes as small as the head of a mosquito and sometimes as big as that of a mastodon, and lighted right and left. Amongst the new photo processes employed by those would-be magicians the following is worth noticing: They place on a table a well-polished silvered basin, or something like it, and, after the usual talk, commence to magnetize the water they pour into it and to evoke spirits. Suddenly they fall into trances, see the spirit in the water, utter incoherent words, and then throw in the basin a sheet of white paper, which perchance happens to be on the table. When, after a few seconds, they turn that paper over, and, O wonder! there upon it is the spirit's likeness! This wonder is nothing, however, but the application of a phenomenon Herschel discovered nearly half a century ago. It is as follows:

A silver print is made on plain salted paper, fixed without toning in a new hyposulphite of soda bath, and, after carefully washing, placed in a solution of mercuric chloride, where the silver forming the photographic image is converted into a white compound consisting of silver chloride and mercurous chloride (calomel). When the image has vanished the paper is perfectly white and nothing can be detected on its surface. Now, this dormant photograph, as the illustrious English philosopher termed it, in contact with a dilute solution of hyposulphite of soda, re-appears with a deep brown color, the mercurous salt being transformed into sulphide.

And now, reader, what do you think about this? What are your conclusions? As for me, I will confidentially tell you the plain truth. The discoverers of these and every other photographic processes, Niépce, Daguerre, Herschel, Becquerel, Archer, Poitevin, Bennett, Vogel, *et tutti quanti*, are sorcerers and nothing else.

P. C. DUCHOCHOIS.

[Written for the "International Annual."]

HANDY HELPS.

BY JOHN NICOL, PH.D.

THE photographer, whether professional or amateur, should be, to a certain extent, a "Jack of all trades," and know just how to improvise all sorts of handy appliances to aid in the hundred and one operations that he is continually called on to perform.

If he is wise, and possesses the genius that is essential to comfortable success, he will have, in some quiet corner of his premises, something that can be converted into a temporary bench, a few simple wood and iron working tools, and especially a lot of old cigar boxes. No one who has not actually tried to make all sorts of things out of cigar boxes can know how really useful they are. Let me mention one use to which I have long put them, just by way of example. My dark slides take plates $7\frac{1}{2} \times 5$, a size not to be found in the American market. I must therefore cut half an inch off of each, not an easy thing to do in the ordinary way. I take the lid of a cigar box—one over 8 inches in length, of course—and glue a strip from one of the ends on the end of it, at a distance from the other end of exactly $7\frac{1}{2}$ inches, less the breadth of the diamond. I lay the 8-inch plate, face down, on a pad of paper, take the cigar box gauge, with the side on which the strip is glued down, lay it on the plate, and slide it till the cross strip touches the end, and then draw the diamond across. In this way, in perfect darkness and with absolute certainty, I can cut a dozen plates in a few minutes.

This same gauge comes in handy for other purposes. I make many lantern slides, sometimes on transfer paper and sometimes on plates specially prepared, and so want to cut lots of plates to the standard size of $3\frac{1}{4}$ by 4. For this purpose I take the sides of the cigar box, and cut one to $3\frac{1}{4}$, less the breadth of the diamond, the other to 4 inches, with the same provision. In this case I lay the gauge with the glued on cross-piece up, lay the plate on it, pressing it close to the cross-piece; lay first the one, then the other of the 4 and $3\frac{1}{4}$ templets, and cut away, turning out unerringly many lantern slide covers or plates on which pictures have been transferred in a few minutes.

Oh, empty cigar boxes are a great institution; and though I am not silly enough to buy cigars, as there is more comfort in a pipe at a tithe of the cost, I have many friends who are, and who keep me fully supplied.

A NEW DYE (?)

BY P. C. DUCHOCHOIS.

ANILINE GREEN—the aldehyde—was discovered by a photographer, Mr. Usebe, in trying to fix pictures. Well! aside from reproducing subjects in the most wonderful manner, photography is occasionally useful for something else, too.

Last week I had to develop some fifty pictures, taken out-doors, on $8\frac{1}{2} \times 6\frac{1}{2}$ gelatine plates, which I did with pyrogallol and the sodic carbonate, my favorite developer. Accidentally I left over night a negative in the fixing solution, which was in a tin tray, such as is used for cooking. The next morning I found that plate stained under the film with a reduction of partly sulphureted metallic silver, showing the usual dichroism, and, to my surprise, the gelatine film was dyed rose-lilac!

In the fixing solution there were consequently the sodic thiosulphate, the pyrogallol from the negatives and the sodic carbonate, besides alum from the negatives also, which before fixing were immersed for forty seconds in a solution of this double salt, to harden the gelatine film, and then rinsed under the tap. The quantity of pyrogallol was, therefore, very small; also that of alum; but the latter sufficient to give rise to the evolution of sulphur dioxide, which was readily detected by its characteristic smell.*

I next ascertained that so long an immersion was not necessary to dye the gelatine film. For after fixing probably six or eight negatives the same chemical action occurred in from ten to fifteen minutes.

In a wooden or porcelain tray the coloration and the reduction do not take place, which shows that the presence of the metal is a *conditio sine qua non*, as should be expected.

Not having the time to investigate the nature of the compound so formed—whose color is similar to that of gallein—I send this communication to the BULLETIN for publication, leaving to a better chemist than I am the task of finding out the constitution of this new (?) dye, and how, if it can be of any utility, to produce it for industrial purposes. In photography it can be used only to color diapositives.

NEW YORK, April 29, 1889.

* The solutions contain also the compounds Na Br and $\text{Ag}_2 \text{S}_2 \text{O}_3$, which have no action in the chemical changes in question.

A COMPARISON OF DEVELOPERS.

BY LYONEL CLARK.

[Before Camera Club Conference, London.]

(Continued.)

To recapitulate the salient differences between pyro and quinol; the attainment of a low curve of intensity practically means that the detail, or least exposed, portions must be brought out rapidly before the high-lights, or most exposed portions, have had time to gather density, and this may be said to depend on the speed with which those details can be brought out. Now, when a small quantity of pyro is present increase of alkali means increase in the speed with which the detail appears; but with quinol, on the contrary, increase of alkali, in reasonable quantity, does not mean increase in the speed of development. In order to obtain this the quinol itself must be increased, in which case the development can be made most rapid, but unfortunately it is attended with an equal increase in density. The experiments show this most conclusively. Potassium bromide remains constant throughout. As its action is always to increase density, and as I was striving to keep density down, it became unnecessary to take this salt into account, although I found that a little is necessary to prevent a general slight reduction of the presumably unexposed portions of the film.

I found no practical difference in results when using the fixed instead of the caustic alkalis; development was undoubtedly more slow, but the gradations were practically the same.

With ammonia, I found the greatest difficulty in getting any sort of an image, unless both the ammonia and the quinol were increased to a very great extent. I find one note, that with a half-grain of quinol no image showed after ten minutes, although 25 minims of pure ammonia were added. The whole of the results with ammonia give green fog and metallic fog in a most virulent degree, and prove, I think, pretty conclusively, that quinol is just as prone to fog as pyro, when used with the same alkali.

Passing now to the negatives developed with ferrous oxalate, we see that the rate or speed of development increases with the amount of the potassium oxalate present, so that it is possible to somewhat vary the gradations of the scale. One curious note, on diluting the ordinary developer with water, increases the density of the negative very considerably, being directly antagonistic to the result of having the oxalate in great excess.

From the above series of experiments I am led to deduct that, as far as regards the getting out of detail, pyro, quinol and ferrous oxalate are all equal. As regards density, that is, the getting of the greatest amount of deposit for a given time of exposure, quinol and ferrous oxalate have, perhaps, the advantage over pyro, but my pyro series of experiments do not obtain any specimens specially made with the idea of getting density; so that it is quite possible that pyro may hold its own even in this, in most cases, very undesirable respect.

With regard to getting a low intensity curve, pyro is a long way the best, ferrous oxalate comes next, and quinol last. I am, therefore, led to believe that for negative work quinol will never oust pyro, to which I consider it decidedly inferior. It is, of course, difficult to make any statement as to the anti-fogging tendencies of quinol, but I am inclined to believe that this is simply a question of the alkali that is used; with ammonia, even with small quantities, quinol gave me green fog as badly as any pyro developer ever did, and I therefore con-

sider that it is not altogether so successful in this direction as one has been led to suppose. Quinol is not as soluble as pyro, and therefore presents a certain disadvantage from the point of view of ready carriage; and, lastly, quinol is more expensive than pyro. Therefore, taking all these considerations into account, I do not think that quinol is destined to survive long as a developer for photographic negatives. As a developer for lantern-plates, owing to the great beauty in the color of deposit that can be obtained by it, it may possibly live long and prosper; but as a developer of negatives its restoration to the country of its birth will be as short as the historically famous restoration of the Stuart dynasty.

DISCUSSION.

Mr. E. J. WALL said that he had made some comparative experiments with hydroquinone, ferrous oxalate and pyro, and had got results that entirely disagreed from Mr. Clark's. He had found that hydroquinone gave the best intensity curve, then pyro, and lastly oxalate. He considered that Mr. Clark had used too much sulphite; he should only have used equal weights, and no bromide. He thought, too, that the best results would be got by a mixture of the carbonate and hydrate of soda. One point he had found efficacious in giving a slow intensity curve was one proposed by an American gentleman, and consisted in soaking the plate in the hydroquinone first.

Mr. WEBBER said that he had had good results from using equal weights of hydroquinone and potassium bromide, and thirty times as much sulphite.

Mr. ELDER did not think that the addition of sulphite made any real difference; personally he used six times the weight. He quite agreed with a mixing of the alkalis, such as the two hydrates, or a hydrate and a fixed alkali, which probably arrived at very nearly the same thing, and had got good results. Some four or five years ago he had made experiments on the fixed and caustic alkalis, and had found the latter to be the best. He wished, however, to protest most strongly against the use of the name quinol, which was ridiculous, as quinol was quite a different chemical to hydroquinone, from which it differed by having one molecule of water less.

Mr. BOTHAMLEY said that the only really reliable experiments that he was aware of having been made hitherto, were some that were carried on in the laboratory of Doctor Eder: from these experiments it was deducted that quinol was a little inferior to ferrous oxalate and pyro, but the carbonate was the alkali used. This pointed out the desirability of making a large variety of experiments, and not deducing results from one experiment only. In treating of the density curve of plates, it was also essential to try more than one brand of plates, for every one knew that although plates might be the same as regards their rapidity, no two gave the same intensity curve. With regard to the name quinol, he had now been for some years one of the abstractors for the Chemical Society, and he had invariably found this salt, one of the phenyl group, properly classed under the name of quinol; and it must not be confounded with quinone, a name which he was not aware had ever been used for hydroquinone.

The CHAIRMAN said that he did not agree with the last speaker's remarks as to the nomenclature of hydroquinone, but a discussion of it would bring up a chemical question foreign to the present paper. With regard to the use of sulphite in the developer, at the present time photographers did not seem happy unless they were making some mess or other. A far better preservative than sulphite was distilled water, and in his first experiments with hydroquinone he had used nothing but pure water, and even when using ammonia he found an entire absence of fog. Of course, if distilled water was unprocureable, and the ordinary water contained lime, then sulphite might be necessary.

Mr. CLARK, in replying, said that of course it had been impossible to try all the combinations of the different alkalis, and if this was to be further complicated by trying each different brand of plates, the time necessary to complete them would be somewhat long. There was, however, no reason why other workers should not take up the thread where he had dropped it, in which case he hoped his experiments might be found of some value. In regard to the nomenclature of quinol and hydroquinone, he personally was entirely indifferent, and he would stand aside and allow the chemists to fight out the battle themselves, and he would then use the victor's name with the greatest equanimity.

ON THE USE OF DRY PLATES IN PHOTO-MECHANICAL WORK.

BY W. T. WILKINSON.

[Before Camera Club Conference, London.]

TWELVE months ago, when any one asked me if dry plates could be used for photo-litho and kindred negatives, the answer was, that there were no plates in the market to be depended upon, giving the absolute clear lines so necessary for success. Now, I am glad to say that there are two brands of plates in the market that give negatives quite as good as the wet process when working at its best. This word BEST will no doubt recall old memories, the reverse of pleasant, in the minds of many who had to put up with troubles that a dry plate worker of to-day knows nothing about. Now, in the case of both the operator can get out of it by opening a fresh box of plates; then, no matter how much care was taken, the negatives could not be made.

The two brands of dry plates alluded to above are Mawson & Swan's photo-mechanical, and England's rapid chloride, and upon either plate negatives suitable for photo-litho or photo-zinco—line, or grained—may be made, equal to the best wet-plate negative, and with infinitely more certainty, and far less trouble.

These plates may be developed with either pyrogallic or hydroquinone, the last being perhaps the best. For the sake of those who would like the formulas I use, they are here given :

Pyro and ammonia :

STOCK PYROGALLIC ACID SOLUTION.

Meta-bisulphite of potash.....	1 ounce.
Bromide of potash.....	640 grains.
Water.....	8 ounces.

Dissolve ; then add 1 ounce of pyrogallic acid ; then make up to 10 ounces with water.

DEVELOPER, No. 1.

Stock pyro, as above.....	2 ounces.
Water.....	18 “

DEVELOPER, No. 2.

Liquor ammonia, .880	1 ounce.
Water.....	19 ounces.

For a normal exposure, use two parts No. 1 to one part of No. 2.

Pyrogallic acid and soda :

STOCK SOLUTION PYROGALLIC ACID.

Meta-bisulphite of potash.....	2 ounces.
Bromide of potash.....	240 grains.
Water.....	8 ounces.

Dissolve ; then add 1 ounce of pyrogallic acid, and make up to 10 ounces with water.

DEVELOPER, No. 1.

Stock pyro, as above.....	2 ounces.
Water.....	18 “

DEVELOPER, No. 2.

Saturated solution, washing soda.

For a normal exposure, use eight parts No. 1 to one part No. 2.

Hydroquinone developer :

SOLUTION, No. 1.

Hydroquinone.....	80 grains.
Meta-bisulphite of potash.....	120 “
Bromide of potash.....	5 “
Water.....	20 ounces.

SOLUTION, No. 2.

Caustic potash, pure stick.....	200 grains.
Water.....	20 “

For a normal exposure, use equal parts of No. 1 and No. 2.

Do not waste time and plates trying the ferrous oxalate, as it is the same with these as with ordinary plates. If ferrous oxalate gives a good negative, any of the above developers would have given a better, *as under no circumstances will ferrous oxalate give as good a result as either pyro or hydroquinone.*

For these plates much more light may be used in the dark room, in fact, should be used, so that the whole progress of the development can be seen with comfort. Two thicknesses of golden fabric will be found quite sufficient.

The generally accepted idea for a photo-litho negative is that it must be dense. Never mind about anything else so long as it is dense. This is wrong. Get as much density as you can without clogging up the lines ; but the first consideration is absolutely clear lines. Get this and the density is of little consequence. Of course, it must be understood that a *gray* negative will err on the other side.

For making grained screens for half-tone type-blocks, these plates are a perfect boon, it being so easy to get screens free from stains and spots—a condition of things not always possible with wet plates. Besides, the density required can be obtained at one operation, instead of the risk of clogging up entailed by the operation of intensifying with mercury, etc.

A few words as to these screens may be acceptable. For the production of half-tone blocks it is necessary to have a variety of these screens ranging in density from a gray to almost a jet-black, the lines in each case being perfectly clear. For each picture to be reproduced a screen must be used that will best suit it. For a flat picture use a thin gray screen, whilst for a hard black and white portrait use the dense screen.

The grained negatives resulting from the use of the screen must be developed so as to get the lines clear. Density must not be aimed at, it being neither possible nor desirable.

For collotype work the wet process has no advantages over good dry plates, as, with care and skill, quite as good negatives of ordinary subjects may be made upon dry plates as upon wet, and that with less trouble and more certainty, whilst for color-rendering the dry plate gives the best results.

Dry plates can be stripped or reversed with just as much ease and certainty as wet plates.

If the mirror be used for making reversed negatives for collotype, patent plate glass must be used, and this would be too expensive from the necessary failures and other causes ; so stripping must be resorted to, and I will here give you the method I have used with unvarying success since 1884. The operations are simple and easy, and its certainty may be judged from the fact that I have never met a brand of plates that it does not suit.

1. Clean a few glass plates a size larger than the negatives to be stripped,

soak them in weak acid, rub both sides with a clean rag, and rinse under the tap ; then coat with the following solution :

Gelatine.....	2 drachms.
Water	20 ounces.
Saturated solution, chrome alum.....	5 drops.

Soak gelatine till soft in the water previously mixed with the chrome alum. Then melt and filter the flood over the wet plate and stand up to dry. These plates improve by keeping, so a lot may be prepared at one operation.

2. Clean back and edges of negative to be turned.
3. Place upon a leveling stand, and cover with as much collodion as it will hold without running off.
4. Let this film of collodion set thoroughly right through.
5. Immerse the negative in clean, cold water, changing occasionally until the greasy appearance is quite removed, and the water flows over the film quite evenly.
6. Immerse the negative in a dish containing: fluoric acid, 2 drachms ; water, 100 ounces. Rock the dish until the corners of film show signs of coming loose. Then remove and wash under the tap, both front and back.
7. In a dish of clean water put one of the gelatinized plates, the gelatine film up. Now place the negative face down upon the surface of water, when by a little careful management the film will leave the glass and float upon the surface of water. Now raise the glass plate gently, carefully adjust the film in position, then lift the two slowly from the dish, and, with a soft squeegee, carefully expel the water from between the glass plate and the film.
8. Flood with, or immerse in, methylated spirit of wine, then place on a rack to dry.

When it is desired to have six, eight, ten or twelve negatives upon one plate, they are stripped as above. Then a plate the requisite size, previously gelatinized, is placed on the bench and covered with water, the films being lifted from the water and placed in position one by one ; when all are in position place a piece of macintosh cloth over all, then squeegee well.

The process given here is perfectly safe, and if one or two points are attended to, there need be no hesitation in turning the most valuable negative.

The important points are, always clean the back and edges of negative, else the tiny shreds of gelatine usually left on the back of gelatine negatives will be detached by the flusic acid, and will get between the film and glass when stripped, and being so very attenuated will be difficult to dislodge.

Be sure and get a good film of collodion upon the negative, so that the stripped film is easily handled, and any risk of frilling prevented. Be sure the film of collodion is thoroughly set before immersion in the water, else a portion of the film will be opalescent. When this does happen, flood the plate with a mixture of ether and methylated spirits, and remove the collodion by rubbing gently with the fingers; then wash and dry, and try again.

Stripping films are not dry plates, in strict sense of the term, but are close enough allied to come under the heading I have chosen, so I will venture upon a few words as to their use.

In making negatives for collotype printing, the roll holder and stripping films will be very useful, as the negatives after development need only be mounted upon patent plate glass—previously collodionized—and when the paper backing is

removed the negative is in its right position for collotype, and if afterwards required for silver or platinum printing can be stripped in the usual way. The Vergara films dried upon collodionized glass are just as useful, as also are Pumphrey's films.

TO MAKE GRAINED NEGATIVES FOR ZINC ETCHING WITHOUT A SCREEN.

BY W. T. WILKINSON.

[Camera Club Conference, London.]

THIS is done by coating the plates with an emulsion containing sulphate of baryta in very fine powder, and well shaken up before coating. Pictures are taken upon these plates, and developed and fixed in the usual way, but the image instead of being smooth and nice will be covered with myriads of fine pinholes. These negatives are used for printing on the zinc, in bitumen, then etched in relief for type blocks.

Instead of sulphate of baryta, carbonate of soda, etc., may be used in the emulsion, and, after fixing, immersion in weak acid will develop the pinholes. The bromo-chloride emulsion may be used upon collotype plates, followed by drying them in the oven at a high temperature, exposing under a reversed negative. Develop and ink up as for the paper, pull the transfers upon ordinary lithograph transfer-paper. To obtain a coarser grain soaking in warm water will develop the reticulation.

SEMI-CENTENNIAL OF PHOTOGRAPHY.



MECHANICS' HALL, MEETING PLACE OF P. A. OF A., AT BOSTON, AUGUST 6-9, 1889.

BUFFALO, N. Y., May 22, 1889.

To the Editors of the BULLETIN :

There is no longer a doubt but that the "Grand Semi-Centennial Celebration of Photography," held under the auspices of the Photographers' Association of America, will be a success. Encouraging news from every quarter indicates that the largest gathering of the photographic fraternity that has ever been known will assemble in Boston on the 6th of next August.

We have been credibly informed that there is a great deal of silent preparation being made to capture some of the "Semi-Centennial awards." Everything tends to show that the contest will be sharp and spirited, more especially for the "Grand Award," which will be not only valuable intrinsically, but bring a small fortune to the lucky man.

In addition to the grand display of art photographs which are to enter for competition this year, we are promised rare specimens that have won prizes during the life of the Photographers' Association of America, as well as a number of collections of the most celebrated pictures made during the last half century.

In the photographic merchants' department the space has never been taken so rapidly or in such large quantities. A letter from Secretary Scott informs me that all the thirty thousand square feet on the main floor have been taken, and we are obliged to put a number on the second floor.

The great manufacturing establishments of E. & H. T. Anthony & Company and Scovill & Adams Company, of New York, and the Blair Camera Company, of Boston, have informed me that they have been making extensive preparations for the past year to have the grandest and most complete display of photographic apparatus ever put on the market.

The Eastman Dry Plate and Film Company says: "Tell the photographers that we will make a larger exhibit than ever before, and our awards will be more costly and greater in number than at any previous convention."

W. G. Entrekin, of burnisher fame, tells us that he is going to ship burnishers to Boston by the ton, that will show all the latest improvements.

The well known house of Smith & Pattison, Chicago, have taken nearly twelve hundred square feet, and "Tom" Pattison says they are going to ship most of their store down to Boston, including their burnisher.

L. W. Seavey has built a new studio, that he might be able to get out the great amount and variety of backgrounds and accessories that he intends to exhibit.

The Stanley and Harvard Dry Plate Companies tell us they will shortly announce some elegant prizes for the best collection of photographs made on their respective plates.

The Acme Burnisher Company, of Syracuse, N. Y., say they will soon make known something new and startling in the way of an award for the best collection of art photographs at the Boston Convention.

A letter from Mr. Althaus, the manager of the Cramer Dry Plate Works, says that Mr. Cramer will return about the first of June, and will be on hand at Boston with renewed health to make a grand display and help celebrate.

These are only a few of the good things that are promised for the photographers who attend the convention, and others will be announced as soon as we are informed.

George H. Hastings, First Vice-President, says that Codman & Company, Benjamin French & Company and the Blair Camera Company will unite with the photographers of Boston to do all in their power to make the Tenth Annual Convention a complete success.

A letter from Tiffany & Company, of New York, says that the silver badges for members will be in the hands of the Treasurer about June 1st, and I would advise all of those members who want to attend the opening ceremonies on the morning of August 6th to send in their dues, and Treasurer Carlisle will send them a badge with receipt. This will avoid the great rush on the opening day.

I would also announce that the headquarters of the Executive Committee will be the Tremont House. Rates, \$2.50 and \$3 per day; \$4, including bath. Many of the older members of the Association will recognize in the proprietor, Mr. Harris, their former host at the Buffalo Convention, when they made the Genesee their headquarters. Mr. Harris promises to do everything in his power to make our visit to Boston a pleasant one. Very truly yours,

H. McMICHAEL.

OUR ILLUSTRATION.

THE picture with which we illustrate this issue of the BULLETIN is a very good example of modern photographic work. It is very artistic in the matter of lighting, the beautiful gradation of lights and shadows upon the animals making a very pleasing picture. It is also interesting as showing what can be done with the new negative films. When such excellent negatives can be made upon films, and with the same ease as upon glass plates, these latter will most surely have to give place to the former. Of course, much of the success of these pictures is due to Mr. Newton's skill as a photographer; nevertheless there are quite a number of workers who use these films in place of glass plates, and are perfectly satisfied. This fact has already been noticed by manufacturers, and our publishers are busy adapting special forms of apparatus to the use of these new carriers of the sensitive surface. With time and experience in their manufacture, the day is not far distant when films will supersede glass plates in almost every branch of the photographic art.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

BOSTON MEETING.

To the Editors of the BULLETIN:

THINKING that perhaps photographers throughout the country would like to know something in regard to the progress and preparations being made for the coming Convention to be held at Boston, August 6th to 10th, inclusive, I will say that, from the present outlook, the Tenth Annual Convention and Semi-centennial of Photography will far excel anything of the kind the Association has ever known.

Everything points to a booming success and a large attendance. All seem to be anxious to attend this, the fiftieth anniversary of our art. And hard indeed are many photographers working to bring home with them a semi-centennial medal.

All may judge of the interest being taken when, at the present writing, out of our 30,000 square feet of space in Stock Dealers' Department, there only remains part of one small section not taken. So great has been the demand for space that almost all has been disposed of by telegraph, nearly every State from Maine to California being represented. Many of the dealers assert that their display will far excel all former attempts. And certainly a more elegant building could not be found, both for the dealers' and the photographers' exhibits, being large, roomy and well lighted.

As to the photographers, many of the more enterprising ones are writing for space. All seem to be more than ever interested this year; and well they may be, for a more elegant line of prizes has never before been offered.

The bronze figure alone will be a fortune to the lucky photographer who secures it.

Then come the gold medals of artistic design and workmanship, and as pure as gold can make them, being twenty-four carats fine. These are being made by the well known and popular firm of Tiffany & Co., New York. All may look for something fine in the way of medals.

The badges will be entirely different from those used at former conventions.

They are to be made of metallic silver, in the shape of a button, similar to those G. A. R. badges, with Daguerre's head stamped in bold relief on the front.

Every photographer throughout the land should possess one of these. Remember, it will be your only chance to obtain a semi-centennial badge, and whether you attend or not, send in your names and dues, and receive one of those souvenirs.

There are many other attractions, too numerous to mention, that will tend to make the Boston convention a decided success. Yours truly,

O. P. SCOTT, *Secretary P. A. of A.*

GEORGE H. HASTINGS, Chairman of Committee on Hotels, has made the following report in the way of letters from the proprietors of several houses :

“THE BRUNSWICK.”

P. A. OF A :—We will make the rate for members of the convention at \$4 per day each.

Very truly, BARNES & DUNKLEE.

“UNITED STATES HOTEL.”

MEMORANDA of rates to the delegates to the Photographers' Association of America, August 6th to 10th. Room and full board for fifty or seventy-five at \$2.50 each. If two men in one room and in one bed, \$2 each. Rooms only, \$1 per day and upwards, according to size and location.

TILLEY HAYNES.

FREDERICK KELSEY, *Attorney.*

“AMERICAN HOUSE.”

To P. A. OF A. :

GENTLEMEN,—We will be pleased to accommodate delegates to the Photographers' Convention, to be held in Boston August 6th to 10th, for \$2.50 and \$3 per day, according to accommodation desired.

To those wishing rooms only and the privilege of taking meals at option, we could give rooms for from \$1 each per day and upward.

Very truly yours,

HENRY B. RICE & Co.

“THE QUINCY.”

MR. GEORGE H. HASTINGS :

DEAR SIR,—We can furnish for any part of your party three meals and one lodging, consisting one day, for \$3 per day for each person; and if two beds in one room, two must occupy the same room.

Yours truly,

J. W. JONSON & Co.

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J. F. MERROW & Co.

A PRIMARY teacher was giving an object lesson on the word transparent. She told the children that water and glass are transparent because one can see through them, and then asked them to name something else that is transparent. One little fellow raised his hand in great ecstasy. The teacher said, “Well, Harry, what is it?” “A hole!” shouted the boy.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

19 ASTOR PLACE, NEW YORK.

INFORMAL MEETING, MAY 15, 1889.

The *Vice-President*, J. B. GARDNER, in the chair.

Mr. O. G. MASON exhibited a camera box he had devised for exposing dry plates of the largest sizes without the necessity of a slide in the plateholder. This box was carefully examined by all present, and regarded as a very practical and clever piece of mechanism, and a great improvement on the old method of exposing large plates.

Mr. Mason said: "As it is my intention to secure a patent, I trust the reporter will only give it a brief notice in his record of this meeting." In compliance with this request, the inventor's explanatory remarks are here omitted.

Mr. Mason also exhibited a number of excellent large pictures of the Centennial parade, taken from the reservoir, corner of Fifth Avenue and 42d Street. These pictures were

greatly admired, and naturally led to a general talk concerning the part photography played in presenting a truthful record of this unprecedented celebration.

Dr. J. W. BARTLETT gave a very interesting account of his efforts in securing some of the most noteworthy scenes interspersed along the line of march, and recounted some of the unexpected difficulties he encountered—thus suggesting the necessity of forethought, careful preparation and experience in order to realize even our most humble expectations. Photography, he said, was not what it seemed to many people, a merely mechanical handicraft, but often required the best thought and skill of both the artist and chemist. To the successful photographer, therefore, was due a higher meed of praise than was usually awarded to him.

Mr. THOMAS FARIS said: "Though I have been experimenting in photography for nearly half a century, I have continually been finding something new and useful in it, and I believe its applications in the arts and sciences are as yet only in their infancy. Holding this belief, I have never ceased to look for some new application that would not only gratify my natural disposition and love for experimenting, but would make photography more serviceable to the world about me."

With this brief introduction, Mr. Faris called the attention of his auditors to a new use to which photography could be applied, and by means of which the art could advance the interests of both commerce and trade. He then distributed examples of the work referred to, and said these pictures were obtained by making negatives from the crystallizations of various salts on glass surfaces, and finally printed and finished by the Meyzenbach process. The variety and singular characteristics of these crystallizations were greatly admired, and many suggestions were made respecting their utility.

Mr. Faris said: "In discovering how these crystallizations could be made both useful and attractive, I have spent no small amount of time and labor, and now that my ideal has been reached, it only remains to establish their commercial value. In my judgment, this new phase of photography can be utilized in various ways; but the indisposition on the part of most people to turn aside from the beaten path is perhaps its greatest obstacle. But whether my labor shall prove to be a commercial success or not, I feel I have been liberally paid; for these experiments have often beguiled an idle hour, banished from my con-

sciousness the ills attendant upon the infirmities of age, and contributed to intellectual powers a wholesome stimulant only attainable while in the pursuit of an object we are most anxious to possess.

The Field Day Committee appointed at the regular meeting, May 7th, reported that no definite time and place had as yet been fully decided upon, but it was expected a decision would be reached in time to notify the Section at its next meeting.

The meeting then adjourned.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

At the regular monthly meeting of the Association, held May 9th, *President* E. M. RUNYON occupied the chair, Major HEUER acting as *Secretary pro tem*.

The Committee on the exhibition of "Illustrated Boston" made an interesting report. Over seven hundred people had filled the hall of the Association of California Pioneers. Every seat was occupied, and many had been turned away, because there was not even standing room left. The audience had been highly appreciative, and as there were many Bostonians present, scenes familiar to them were greeted with applause.

The Committee on the preparation of the slides and the paper to illustrate and describe "Glimpses of California" reported some progress. The work had been completely mapped out; and so soon as gentlemen having certain negatives would send in slides and prints of them, the collection would be completed and the lecture ready for delivery. Negatives of those subjects not possessed by the Society were being made. In one instance a gentleman had volunteered to secure a negative of the San Diego Mission, the first settlement of the Spanish missionaries in California. This offer will be appreciated when it is understood that to do this means a trip of five hundred miles.

At the conclusion of the business of the evening, which included the naming of committees and the appointment of Corresponding Secretary for the ensuing year, Dr. Max Boelte prefaced the exhibition of Dr. Piffard's new dark room lamp by remarks upon the various experiments of Burton, Vogel and others towards securing a safe light for the dark room.

Various negatives were exhibited which had been developed after long exposure to the flame of the lamp. They were without trace of fog, while other negatives exposed under

similar circumstances to other dark room lights were quite badly fogged.

The construction of the lamp is very simple, consisting of a Bunsen burner, around the tube of which and projecting at the top is placed a cylinder of asbestos and sodium. The supply of air is regulated by a simple valve underneath until the flame is seen to be entirely non-actinic or free from blue rays. To improve the lamp and for further protection an amber colored chimney is used. To those amateurs fortunate enough to have gas in their dark rooms this lamp will be a blessing.

The Doctor also exhibited the Piffard Flash Lamp. It somewhat resembles an argand burner in appearance. The principle is so simple that one wonders it has not suggested itself to every one making flash-light pictures.

An air pressure bulb is attached by a rubber tube to a cylinder. In this cylinder is placed a piston containing a lighted punk. Over it is a stand holding the magnesium powder spread on gun cotton. A pressure on the bulb forces the lighted punk into contact with the cotton and complete ignition of the powder results.

Dr. A. P. Whittel, a corresponding member of the Society, recently described in a very interesting letter his trip to Europe by way of Panama. His letters of introduction from the President of the Pacific Coast Amateur Photographic Association were presented to the English Societies and he met with a most cordial reception. This suggests that whenever a member of a Society is about to travel he should request from the officers of his Association general letters of introduction. Such endorsements when presented cannot but result in pleasant acquaintances, aside from the use of dark room privileges. Speaking for our own Association, I can say that should the readers of this bring letters or introduce themselves to our Secretary, Mr. G. Knight White, 89 Flood Building, San Francisco, they will be cordially welcomed.

To conclude the evening a number of interesting foreign slides belonging to a private collection were thrown on the screen. Among them was a slide of the new cruiser, "Charleston," taken as she was on her way to Santa Barbara Channel for her trial trip.

A. J. TREAT, *Corresponding Secretary*.

CINCINNATI CAMERA CLUB.

THE first meeting of the month was held at the rooms of the Club Monday evening, May

6th, Mr. BULLOCK in the chair. In the absence of the Secretary the minutes were omitted and Mr. Kelley appointed Secretary *pro tem*. One new member was elected. A motion prevailed as the sense of the Club that its interests would be best subserved by a declination of prizes of money value to members for work done on the annual excursion. A suggestion was adopted that the Excursion Committee offer diplomas for two or more grades of work done on the annual excursion, and that prints of the same be framed and hung in the Club rooms with proper mention.

Mr. BULLOCK, after addressing the Committee on the work expected of them, read a paper on composition generally and the duties of the Exhibition Committee specifically, especially with reference to lantern slides. The paper was intelligently and carefully prepared, and was well received, although not concurrently. The subject started a lively discussion, and more may be expected from it. The reports of Treasurer and Librarian showed the Club to be in general good condition; forty-five new members received during the year, making a total to date of one hundred and eighteen.

At the close of the meeting refreshments were served to the members and their friends, making the evening one of pleasure as well as profit.

The second meeting of the month, May 20th, opened with the President and Secretary in their places. Two members were elected.

The Excursion Committee stated their arrangements for the outing on May 30th.

Mr. KELLEY read a paper following the papers of Messrs. Johnson and Bullock at previous meetings. Mr. Bullock had maintained that general interest in the picture should determine whether it should be publicly exhibited. Mr. Kelley, not ignoring the interesting, thought that selections should be governed by the technical and general excellence of the photograph as well. These papers provoked a good-natured and desirable discussion. Dr. LEBOUTILLIER followed, advancing the merits of pictures with life in them, because they were apt to meet applause. Mr. FISHER advanced novelty as a very desirable feature. Mr. PECK heretically advanced the view that, as we cannot all be great artists, if the photograph is good and the maker and his friends are satisfied with it, it ought to be accepted. Mr. JOHNSON, not disputing any one, thought that the exhibitions each year should show study and improvement as to general excellence. The Chairman of the

Exhibition Committee rose to motion the thanks of the Club to Mr. Kelley and the members taking part in the discussion, giving assurance that each and all the ideas advanced would be considered in their selections. The Chicago slides were shown at the close of the discussion, following which Mr. Prince gave practical demonstrations with positive films. Mr. Bullock also showed samples of his work with same.

At a late hour the meeting adjourned.

H. C. FITHIAN,

Corresponding Secretary.

ST. LOUIS CAMERA CLUB.

MAY 7, 1889.

President BAIN with twelve members present.

The minutes of the last meeting were read and approved as read.

Secretary BUTLER—The report from Mr. Collins, the special committee of one to procure a charter for the Club, is as follows:

To the St. Louis Camera Club:

The undersigned, having been designated by your President as a committee of one to procure a charter for this organization, respectfully reports that in the name of the three principal officers of the Club he applied to the Circuit Court, City of St. Louis, for such charter, in due course obtained a *pro forma* decree of incorporation, had the same filed in the office of the Recorder of Deeds for the City of St. Louis, State of Missouri, and in the office of the Secretary of State for the State of Missouri, and that the Secretary of State has issued and delivered to the undersigned a certified copy of all the above mentioned papers, together with a certified copy of the Constitution and By-Laws of this Club, which under the State of Missouri constitute the charter of this Club.

The papers constituting the charter of this Club are herewith submitted.

Respectfully,

ROBERT E. COLLINS.

Upon motion of Fr. Charropin a vote of thanks was tendered Mr. Collins for his personal exertions in procuring the charter for the Club.

President BAIN—We would like to hear the report of the May Field Day Committee.

Mr. BALL—The report of the May Field Day Committee is as follows:

Last year the Club used for the May Field Day excursion a coach belonging to some hunting and fishing club, but this year I could not

find out where it was, but if the members wish me to investigate any further in that direction I will try again and see if I can succeed in finding it. It will hold, I think, about seventeen persons, and Mr. Arnot said that he could let us have a wagonette if we needed it, that would hold about as many more. I also found that we could go to Valley Park, on the Frisco road, for seventy cents for the round trip; and that we can get a coach on the Colorado Railroad to go out on the regular train to Port Royal, on the Missouri River, and there meet an engine to take us anywhere on the road we wished until the time of the regular train to take us back to St. Louis. We can get this coach and engine for \$50, and I think we can get a greater variety of views on the Colorado Railroad than any of the other places.

After a discussion on the part of a number of the members, Mr. Jewett moved that the Committee which had already been appointed for the purpose be authorized to communicate with the members of the Club by circular or otherwise, to give the members a chance to express their opinion, and that then the Committee be empowered to decide upon the place and time for the excursion and make the necessary arrangements.

Motion was carried.

An application for active membership from Mr. Harry L. Bauer was read and referred.

After balloting, etc., Messrs. Henry Hitchcock, Jr., Frank J. Hickman, Malcolm H. Ellis, Fred. G. Howe, George B. Compton and Charles S. Moffitt were all unanimously elected to active membership.

Upon motion of Mr. Butler the Lantern Slide Committee were authorized to make all the necessary arrangements to prepare a set of slides with lecture to be called "Pictorial St. Louis."

Upon motion of Mr. Butler it was decided to have a printed list of all the subjects of which negatives for Lantern Slides for the above exhibition could be made, and to send a list to each member of the Club, requesting him to advise the Committee which negatives he could furnish the Lantern Slide Committee.

The meeting adjourned at 9.35 P.M., after which the slides known as "Illustrated Boston" and the slides of the Philadelphia Club were exhibited.

W. M. BUTLER,
Secretary.

CASE SCHOOL CAMERA CLUB (CLEVELAND).

At a special meeting of the Club held Friday afternoon, May 24th, Lafayette D. Vorce took a composite photograph of about ten or twelve of the students. His plan was to stretch a wire with a knot on it and have each

student in his turn sit so as to have the knot come on the bridge of his nose. Owing to the want of a good head-rest the resultant picture was not all that could be desired. This will most probably be the last meeting of the season, as examinations will soon take place.

MILTON B. PUNNETT,
Corresponding Secretary.

Bibliography.

NATURALISTIC PHOTOGRAPHY. By P. H. EMERSON, B.A., Etc. New York: E. & F. Spon, Publishers.

This is a handsome small octavo volume of about 300 pages, well printed on fine paper and artistically bound in white linen with black lettering and red lines. These combinations of the bookmaker's art are entirely in keeping with the goodly contents of the treatise within.

In his introductory chapter the author says: "We propose in this book to treat photography from the artistic standpoint. We shall give enough science to lead to the comprehension of the principles which we adduce for our arguments for naturalistic photography, and we shall give such little instruction in art as is possible by written matter; for art we hold is to be learned by practice alone. * * * The photographic student, whose aim is to make pictures, will find in this book all directions, such as the choosing of apparatus, the science which must be learned, the pictures and sculpture which must be studied, the art canons which are to be avoided, the technique to be learned, including all manipulations," etc.

What the author states above has been most faithfully carried out. There are few books on photography that have appeared recently which are written as plainly and as carefully as the one before us. The author is not only an artist, but an indefatigable worker in the studio, field and dark room. He knows whereof he speaks, and his readers feel that they have a guide who knows the way from having personally followed the route which he indicates as best for others. The book is excellent in more ways than we can now express; and we can only give our readers a small idea of many good things it contains.

After several introductory chapters on such subjects as the terminology of art and photography and the phenomena of sight as applied to art, the author discusses: Photographic technique and practice, such as camera, tripod, lens, dark room, studio and

furniture, focusing, exposure, development, retouching, printing, enlargements; together with mounting, exhibiting, etc. In the artistic part he speaks of educated sight, composition, out-door and in-door work, hints on art and decorative art.

In the above few lines we have indicated the scope of the work, and any photographer who cares anything about his art other than mere bread-winning will find the volume full of practical suggestions that will delight him, and show the steps to a higher level in artistic photography.

THE CHEMISTRY OF PHOTOGRAPHY. By Raphael Meldola, F.R.S., etc. New York: Macmillan & Co.

The volume before us is the result of a series of lectures delivered by the author at the Finsbury Technical College, in London. It is a small octavo of about 370 pages and thoroughly well written. Unlike most writers upon this important subject, the author has adhered closely to the matter embraced in the title of the volume, and the result is one of the best books of the kind we have ever read. In the first place, the author is a thoroughly good chemist, well up with the advanced phases of photography; and secondly, he has all the force and vigor of an accomplished lecturer, with demonstrations that drive home the truths he wishes to inculcate.

We have read the volume from cover to cover; we have enjoyed the clear style of the author, and have seen the most intricate problems of photography discussed with a force totally unlike anything hitherto presented. We wish we had space to present our readers with extracts from this exceedingly valuable work; it must suffice to give a few of the topics discussed.

In these lectures the author speaks about: photo-physical and photo-chemical changes, embracing iron, copper, mercury, uranium, gold and platinum salts; the silver haloids, Carey Lea's photo-salts; the action of sensitizers; the collodion process; collodion dry plates; emulsion photography; collodion and gelatine emulsions; the process of ripening, sensitiveness of the silver haloids; the latent image; theory of developers; collateral phenomena of development; reversal of image or solarization; colors of natural objects; photo-chemical decomposition and absorption of light; photography of red rays; orthochromatic photography; fixing agents; intensification; reducing the image; printing; emulsion prints; toning; platinotypes, and a number of other minor topics.

We strongly recommend this volume to our readers, and believe it to be the best book of the kind in the English language.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—W. S. E. writes: Will you please inform me through your columns of the BULLETIN how to make lemon of tartar? I bought some from an agent once; it was already prepared; I used it for taking albumen and foreign matter out of silver bath. The moment the tartar is put into the bath it brings the albumen and foreign matter to the surface as a scum which can be filtered out. Before I got this I had to evaporate my silver bath very often, but this purifies it alone. I have used the same bath about eighteen months and have not evaporated it during that time. I also use it in the toning bath, which gives a beautiful brilliant tone.

A.—We have heard of this material before. The name is a misleading one; there is no chemical substance that we know of that goes by that name. Send us a small sample and we will tell you what it is. We fear it is some simple remedy, already well known, that these agents peddle to unsuspecting photographers at high prices. Let us have a sample. An analysis will soon teach us what it is and we will inform you about it.

Q.—J. H. A. writes: Is it not a fact that a well-timed plate requires a much stronger developer, both in pyro and soda, than one slightly under-timed; and, at the same time, requires one-fourth the time to develop? About how long should it take to develop a well-timed plate with a developer properly mixed for the best effect, provided the light is all right? Why is it that I cannot get a bold, brilliant print from a negative of medium intensity—one that will print in bright sunlight in about two minutes? My bath is 50 grains strong, just alkaline; would it suit these negatives better if it was weaker or stronger? Is it advisable to use a 4-inch retouching glass all the time for retouching, and is it injurious to the eyes? Where can I obtain a Decoudan photometer and how much does it cost? I know a fine workman who says paper cannot

be fumed too long for him. He often fumes all night, and says it cannot print too blue for him. What is your opinion about it? Could it be that he uses an acid bath? I have used the following pyro developer for some time and find that it works better when it is new. It is claimed that it keeps indefinitely:

Sulphite	6 ounces.
Pyro	1 ounce.
Sulphuric acid.....	1 dram.
Water ..	80 ounces.

Would an increase in the quantity of the developer make up for old age, when it fails to develop as intense as when new?

A.—An undertimed plate requires a little different handling from one properly timed. The undertimed plate will generally need the stronger developer, but this depends upon the kind of plate used; a very sensitive plate will fog with a strong developer before you have a chance to bright out the picture. It is always better to go slowly at first, using a weak developer, in both pyro and soda, and with an undertimed plate finish in a strong developer in another dish. Of the two, the properly timed plate will develop more quickly than one undertimed, using the same precautions; but the difference of time is a matter of difference of exposure. A well-timed plate should be developed in from one to two minutes. Bold, brilliant prints are only obtained from first-class negatives, where the image is without stain and the lights and shadows are properly graded. This depends upon both exposure and development being well managed. Your bath appears to be the right strength, but would work better if just acid. We don't think a good retouching glass hurts the eyes while being used; its function is to assist them. Write to our publishers about the photometer; they will import it for you if not obtainable here. Long fuming does not hurt the quality of prints; it makes them usually of a much darker tone than short fuming. The pyro developer you give formula for will not keep unless the bottle is kept well corked, and then no great length of time. It is better to make a strong stock solution and dilute when needed. Try the mixture you give with only 20 ounces of water; this will keep many months in good condition. You only need to dilute with three volumes of water to have your regular developer.

Q.—A. J. F. writes: I use a Darlot wide-angle lens which covers a $6\frac{1}{2} \times 8\frac{1}{2}$ or 8×10 plate, according to diaphragm, and I want to take pictures of parties, groups, etc., by flash-

light at night. 1. Is my lens suitable? If so, what sensitometer plate should I use? 2. How much magnesium powder should I use in a good sized parlor? 3. And how much in a large hall or theater? 4. What do you consider best lamp to set off powder for instantaneous work? 5. In taking instantaneous views in parlors is one light sufficient? 6. And would it be necessary to use two lamps in hall or theater?

A.—A wide-angle lens is not suitable for this work, unless it covers a plate at least a size larger than the one in use. Use plates of about 25 degrees Warnerke, or say 50 on Cramer's scale. Thirty grains of magnesium powder in two charges, at different positions in room, is about right. In a large hall you may have to use an ounce of powder in six or eight charges. The best lamp for small groups is called the Mize Flash Lamp; for large halls, etc., it is better to use the Reeves Lamp. The number of lamps would depend upon the number of charges.

Q.—M. L. M. writes: Beaumé's hydrometer is spoken of in the BULLETIN. Which scale is used in testing developing solutions and other photographic chemicals? I saw a scale marked as follows: Beaumé's scale for acids, Temperature, 60° F., 70-60-50-40-30-20-10-0, the latter figure at top. Is this the one I want, and which is spoken of in your magazine? On page 208 of BULLETIN, in the formulas of pyro and hydroquinone given by D. Bachrach, Jr., no proportions are given. What are they?

A.—There are two Beaumé scales for hydrometers—one with the zero (0°) at the top, used with *heavy* liquids, as acids, etc., also for developers; the other scale has the zero (0°) at the bottom, and is used for *light* liquids, as alcohol, benzine, oils, etc. The heavy scale is the one most useful to the photographer for his developing and other solutions. Mr. Bachrach is the only person who can answer your last question, and may kindly do so.

Q.—“One of your oldest subscribers” writes: When a negative is forced with hydroquinone developer it generally leaves it of a yellow color. Can you tell me how to remove this yellow stain? I have tried citric acid and alum, and alum alone; but they seem to have no effect upon it whatever, and I have lost some valuable plates (transparencies) by being unable to remove this yellow color. Please try and help me out.

A.—Try alum solution, with about 1 dram of pure hydrochloric acid in a quart of solution.

Views Caught with the Drop Shutter.

MR. G. CRAMER, the well known plate manufacturer, gave us a call the other day on his return from Europe. His health, we are glad to note, has greatly improved, and we hope to see his genial face with us at the Boston jubilee. Mr. Cramer has taken to athletics, and, we hear, has become quite expert. Our friend Stuart, at Hartford, and the other athletes of the Photographers' Association of America, should go into training at once, or they will feel very mild at Boston, in August, if G. Cramer should engage with them; but then he is too genial a spirit to hurt any one, and there are hundreds who, with us, are ready to welcome him home.

T. H. MCCOLLIN, the well known Philadelphia merchant, was married recently, and sailed for Europe on his bridal tour on May 25th, in the Cunarder "Etruria." We wish the happy couple a pleasant journey and safe return.

W. B. BRADY, one of the earliest workers in photography, after some years of retirement, is again going to take up the photographic art, and will open a new studio at Pennsylvania avenue and Thirteenth street, Washington, D. C.

SCHAFFER BROTHERS, of Poughkeepsie, have opened a new photographic and art studio on Main street, in that city. Their exhibition room is 64 x 70 feet, and the walls are hung with portraits, crayons, etchings, artotypes, etc. The operating room is the largest in the city, 50 x 21 feet, and has a skylight of ground

glass 18 x 16 feet. The store-room for negatives is 35 feet long, and corresponding dark rooms are provided. This is certainly one of the best studios along the Hudson River, and we wish the Brothers Schaffer every success.

L. W. CLARKE, recently employed at Eastman's studio, Portland, Oregon, committed suicide on May 5th by shooting himself. No immediate cause can be assigned as a reason for his rash act. He leaves a wife and two children.

We understand that our note about MORRIS EARLE & COMPANY, in the last issue of the BULLETIN, was incorrect; the firm is still W. H. WALMSLEY & Co.

In the *Amateur World*, of Philadelphia, we note three excellent portraits of the members of the enterprising firm of BUCHANAN, BROMLEY & Co., with biographical notices of each. The stories of their early lives show these gentlemen to be well fitted for the work of the successful photographic merchant.

MISS LOUISE BARRON FREDRICKS, the daughter of Mr. CHARLES D. FREDRICKS, the well known New York photographer, was married to Mr. J. Price Warrick on June 4th, at Trinity Church, Newark, N. J. The happy couple have our best wishes.

WOODARD, CLARKE & Co., of Portland, Oregon, send us their handsome catalogue of 200 pages, containing all the latest apparatus, even the Phantom and Lilliput cameras of our publishers. It is well printed and finely illustrated, and speaks well of the enterprise of the Portland merchants.

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PARIS EXPOSITION AND EIFFEL TOWER.

1889.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor*.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

JUNE 22, 1889.

Vol. XX.—No. 12.

SOME NEW FORMS OF METALLIC SILVER.

THAT an elementary substance like metallic silver should exist in several different forms is quite surprising, but not altogether remarkable when we stop to think of the possible nature of the elements generally. It is now a common belief among chemists that the so-called elements are really compound bodies, and occasionally we hear of some new method which makes it possible to rend asunder the bonds that unite these compounds. Quite recently two German chemists have proved that the metals which we have called cobalt and nickel are really compounds of these metals with another metal which they call gnomium. So the character of elementary substances is constantly being disputed or new facts about them are being revealed in a sometimes very surprising manner. Working in this line of research, Mr. M. Carey Lea, of Philadelphia, has obtained some new facts about the metal silver, a simple statement of which will appear almost startling.

In a very exhaustive paper sent to the *American Journal of Science*, Mr. Lea tells us of three forms of metallic silver, that are almost entirely different from the ordinary metal. One of these new forms of the metal is soluble in water. Another is insoluble in water but readily dissolves in presence of some neutral substance that does not act upon it chemically. Yet another form of the metal has the color and lustre of gold. These results are the outcome of the researches of Mr. Lea upon the photo-salts of silver, an account of which appeared in the BULLETIN some time ago. From what has been learned of the new forms of metallic silver just discovered, it appears that this metal can exist in several conditions, which are probably the basis of the various photo-salts of silver formerly described by Mr. Lea, and are possibly molecular combinations of the metal that lead to new and hitherto unknown haloid compounds, and may ultimately serve to solve that knotty problem, the nature of the latent photographic image.

In the paper kindly sent us by Mr. Lea, and accompanied by a set of specimens that fully illustrate every fact described by the author, we note the following :

These new forms of silver can be classed under three heads. First, the soluble variety, which gives a deep red solution, and when separated gives a mat sur-

face of lilac, blue or green when moist, and becomes bluish-green and metallic when dry. Second, the insoluble variety derived from the first, which is dark reddish-brown while moist, resembling the first variety when dry. Third, the gold-colored variety, dark bronze whilst wet and resembling burnished gold when dry. Another modification of this third variety is copper-colored.

Of these strange forms of silver there are several properties tóally unlike the ordinary metal, and yet common to all. Thus, by drying the particles of in optical contact upon glass plates, metallic mirrors are formed, and when spread on paper the lustre is as perfect as that of gold leaf. Again, by spreading these new forms of silver upon paper and then acting upon them with some haloid compound, such as perchloride of iron or iodine dissolved in potassic iodide, beautiful prismatic colors are obtained, resembling the colors of a peacock's tail. Another peculiarity of these new substances is that they pass instantly into ordinary gray metallic silver under the action of acids, even such weak acids as acetic. And lastly, all these new forms of silver can be readily reduced to powder by trituration.

The soluble variety is obtained by adding a mixture of ferrous sulphate and sodium citrate (really ferrous citrate) to a solution of silver nitrate. This gives a lilac-blue precipitate which is soluble in pure water to a deep blood red color, and by analysis this soluble substance contains over ninety-seven per cent. of silver, the rest being ferric citrate, which it is almost impossible to separate from it by washing. It was further found that the proportion of citric acid in the new substances is variable, therefore they are not compounds of silver with this acid. Furthermore, these new bodies all amalgamate readily with mercury by simple friction.

The insoluble variety is obtained from the solution of the soluble variety by adding almost any neutral substance. Thus the sulphates of sodium and magnesium produce this result, nitrates and citrates can also be used, and even gum arabic answers the purpose. The analysis of the insoluble variety gives almost the same results as were obtained with the soluble substance.

In the case of the gold-colored variety, a solution of silver nitrate is precipitated with ferrous tartrate. This substance has a slightly higher percentage of silver than the two former modifications, *viz.*, ninety-eight and seventy-five hundredths of the metal.

The specimens kindly sent by Mr. Lea are very interesting. The color of the materials is totally unlike ordinary silver; the glass plates coated with the new substances are very perfect mirrors, and the papers showing the action of haloid reagents give a most beautiful display of iridescent colors. We tender our best thanks to this distinguished experimentalist for his kindness, and congratulate him on the very important results he has obtained. We wish we knew of more such earnest workers in the cause of photographic progress.

EDITORIAL NOTES.

THE Photographic Section of the American Institute are to have their annual outing and dinner at Hotel Brighton, Coney Island, on August 27th next. It has been suggested to us that this date may be the time when the tide is low in the day-time between the hours of noon and three o'clock in the afternoon. If this is true for that particular date, we think it would be a good idea to set some other day for the outing when good surf pictures could be obtained during the

hours of good sunlight. A week earlier or one later would make no special difference if this phase of the ocean could be secured.

THE "International Annual" for 1889 seems to be meeting with even more favor than its predecessor. We hear nothing but good words for it from all quarters. It is certainly fully up to the former volume, and many consider it an improvement. There is no doubt it fills a very useful place in photographic literature and occupies a field hitherto neglected, giving during the summer months a fund of most useful information when there is leisure to digest it.

CONFERENCES in celebration of the semi-centennial of photography are the order of the day. Italy had one on May 26th, and our Scandinavian friends at Christiania, Norway, had theirs on June 11th. We hope that in all these, very careful records will be kept of the reminiscences of the older artists, that we may hand down to the future some perfect historical data relating to the origin and development of photography.

WE should be glad to learn the address of McPherson and Oliver (or either of them), two photographers who took views all through the Department of the Gulf during the war, and who had a headquarters in New Orleans. They left for the North about July, 1864, when the Nineteenth Army Corps returned. If any of our readers can tell us what became of them, or where the pictures they made can be obtained, we shall be gratefully obliged.

COLONEL WATERHOUSE, of the English army in India, has been working on the new coloring matter called rhodamine as a substitute for eosine and similar bodies for making gelatine plates color-sensitive or orthochromatic. This new substance is very much like the blue eosines, such as cyanosine, and gives a strong scarlet fluorescence. This fluorescence is not destroyed by acids, as is the case with the eosines. A solution, 1 in 10,000, is used with 1 per cent. of ammonia, as a bath for the plates. It is considered to be not equal to erythrosine as a color sensitizer, although it sensitizes for yellow and orange.

A NEW material for developers has just appeared in Germany, called "Eikonogen." It is a white crystalline powder, which when dissolved in water with sulphite of sodium does not turn brown. It is said to have greater developing power than hydroquinone or ferrous oxalate, and to possess many of the good qualities of pyrogallol. The negatives are of a blue-black color, and full of the finest detail. Like hydroquinone, it can be used three or four times before being thrown away, and allows of considerable latitude in the exposure.

Dr. ELLERSLIE WALLACE, 1305 Arch street, Philadelphia, is very anxious to obtain a copy of the BULLETIN for January, 1879, to complete his set. If any of our readers have an extra number to spare they should communicate with Dr. Wallace.

MR. J. E. DAVISON, of the Providence Camera Club, sends us a handsome catalogue of the late exhibition of the Club. It is an excellent piece of work, neat, handy, well printed, and illustrated with four photo-mechanical prints,

reproductions of some of the pictures exhibited. The exhibition was very successful; about one thousand persons visited the rooms, and one of the most attractive features was the lantern slide display each evening. The Club had an outing on May 30th, and many good pictures were obtained. Three prizes for the first, second and third best landscapes obtained during the outing are offered by the Club.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Another New Light for Enlarging and Spectroscopic Purposes—The Confusion between H. C. Vogel and H. W. Vogel—The Forthcoming Berlin International Photographic Jubilee Exhibition.

WE have here set all sails towards artificial light. Again a new lamp has been invented—not for portrait work, but for enlargements. I have tested it, and must confess that it is excellent for amateur work; yes, even as a substitute for the Bunsen burners, particularly for spectrum work and where gaslight is not at disposal; and there are a good many such places here and in the States. It is a Ligroin lamp, and Mr. C. Fabricius, in Vienna, has undertaken to modify a system of Ligroin gas-lamps of his own construction, which for a number of years have been in successful use at numerous industrial establishments in Vienna, in cooking and heating apparatus, soldering lamps for different chemical and technical manipulations, etc., by a lucky combination with an Auer's incandescent light in such a way that they are applicable for illuminating lamps generally, but particularly as an excellent light source for projection purposes. The lamp itself acts as a Bunsen burner, but if a network of zirconia is suspended in the flame, this will change to a white light, much whiter than gaslight. Such a Ligroin incandescent lamp, placed once in activity, furnishes gas continuously for a duration of three hours after being filled (lamps of larger size admit a much longer duration), and produces a white, radiant light of great brilliancy and photographic activity. Herr A. Moll, in Vienna, has introduced the lamp into the market.

An examination by Dr. Eder and Captain R. v. Reisinger (particularly with regard to its photographic effect in the sciopticon for enlargement on gelatino-bromide paper) of the Fabricius incandescent light proved that the kerosene light now in general use appeared strongly yellow in comparison with the new light; the latter required only the third or fifth part of the time of illumination which the kerosene lamp required, and it may be remarked that the kerosene lamp used for these tests was taken from a very good sciopticon. This incandescent light is, therefore, advantageously applicable to photographic enlarging purposes, and, besides, possesses the agreeable property of producing no smoke or bad smells, which unfortunately is too often the case with the ordinary kerosene oil lamps if not properly taken care of.

In a similar way the new incandescent light proves also very effective in the copying process upon emulsion films; it ranks, therefore, between the ordinary kerosene light and the zircon or calcium light. The tests made at the Royal Academy for photography and reproductive processes resulted for the new light in a photographic action upon bromide of silver gelatine of 60 to 70 candles, if compared with the photographic effect of an English normal candle of 45 m.m. height of flame as a unit, placed at the same distance.

The photometric comparison with the eye gave, however, only 60 candles, because the blue rays act less upon the eye. It is to be remarked that a prolonged use reduces the illuminating power of the reticular glowing body; the latter has then to be replaced by a new net.

(Description of lamp will appear in next issue of the BULLETIN.*)

We have now the fiftieth anniversary of photography, and in every part of the world where there are photographers the jubilee of photography will be celebrated this year. It is, therefore, certainly agreeable to hear that now a really excellent bust of Daguerre exists, namely, by Arthur Kaen, in Vienna, and to be had from A. Moll. It is made in plaster of Paris, and the price is, according to quality (plaster, ivory or bronze imitation), \$7 to \$10. Mr. Kaen informs me that he has modeled a bust and high relief-medallions of Daguerre, thus meeting the wishes of a good many who like to come into the possession of a likeness of Daguerre, and one true to nature; these having been copied from the most authentic pictures, particularly after a photograph in Snelling's "Photographic and Fine Art Journal," 1855, which is considered the best and most natural portrait ever taken of Daguerre.

Busts and medallions of Joseph Nicephore Niepce, who deserves the same honor in regard to the invention of photography, will follow in a short time.

The approaching jubilee celebration is the most suitable time for the acquisition of these portraits, and as the disciples of many other arts and sciences do homage to their masters by decorating their dwellings, studios and workshops with their busts or portraits, there can be hardly one among the many representatives of photography who should not have a similar desire for decorating his place, according to taste and means, and thus do honor to the memory of such highly meritorious men.

I received from Washington an index of literature, and this has induced me to say a few words about the confusion between the names of H. C. Vogel, director of the Potsdam Observatory, and H. W. Vogel, correspondent of this paper, and director of the photo-chemical laboratory of the Royal High School, Charlottenburg. This confusion is all the more easy, as both gentlemen work in photography and spectrum analysis and have published articles about the same. Even Abney ascribes in his "Treatise on Photography of the Ultra-red Spectrum" part of the discovery of the color sensitive process not to H. W. Vogel but to *H. C. Vogel*. A correction, which was furnished to him, was disregarded. The confusion is greatest in the index of literature of the spectroscope, by A. Tuckermann (Washington, 1888). H. W. Vogel's work about the hydrogen spectrum (Berlin Academy, 1879), further about oxygen and nitrogen spectra (Annals Ch. and Ph. 146, and reports of the German Chemical Society, XII, 532), is here erroneously ascribed to H. C. Vogel. Another work of H. W. Vogel, about relation between the absorption of light and chemism, is ascribed to H. V. Vogel. The work of H. C. Vogel about spectrum investigation with the large Vienna refractor is, on the contrary, ascribed to H. W. Vogel. This is only an example of the many and increasing confusions. This could probably be avoided if both authors would add the address to their names.

Our exhibition of the Amateur Society in Berlin is developing more and more; the sister of the Emperor, Princess Royal of Germany, has assumed the protection, and American exhibitors of highest reputation have already con-

tributed. Medals will be awarded. The Royal Academy of War have given their rooms for the Exhibition. The opening day is on the 18th of August, the publication day of daguerreotypes.

FUMING PAPER.

Now, my dear Doctor, I do not mean to take up this old, old topic to give advice or instruction about the actual fuming of paper for the purpose of printing. I am going to bring up a scrap of ancient history—ancient photographically. Not long before the death of Mr. Henry T. Anthony, I had a long talk with him in regard to the fuming of albumen paper before printing. I was then just beginning to try to print my own negatives. I had encountered all the difficulties that had ever been heard of, and a good many besides that were absolutely new, and upon which I held an undoubted sole and exclusive control. In a word, I was an amateur just beginning. Mr. Henry Anthony's advice, good nature and kindly interest in my troubles were unbounded. He modified formulas and found remedies for me, and did all those helpful things for which he was so famous.

It was during one of these discussions of amateur phenomena of a most startling kind that we drifted off upon the general subject of fuming. He told me that at the time when he invented the process—for it was invention and not discovery—the firm was doing a large amount of printing. If memory serves me rightly there was an immense demand for stercos and other war pictures. The factory of which he then had charge was rushed to its utmost capacity. After the prints were made and went to the toning room, the trouble began. They worked slow one day and quick the next. Sometimes they would not tone for so long a time that it seemed that they would resist the bath altogether. Reasoning upon the acid character of the paper as it came from the various solutions in the process of its preparation, and the effect which this would naturally have upon the chemical reactions which took place in the toning bath, he concluded that it ought to be made alkaline. Having reached this conclusion on his way down-town, I think he proceeded at once to put the idea in practice. He took a piece of sensitized paper and exposed it to the fumes of ammonia. Here I regret that I forget the details of the first fuming, and the box which was used for the purpose. The paper was fumed, printed, and, of course, toned without difficulty. After that there was no more trouble of importance in that department. The printing was rapid and the results which followed vastly better than anything that had been done before. This was some time before any one had published anything on the subject. It was in one sense a shop secret. But Mr. Anthony was not a man to hide such an improvement altogether. Among others to whom he at once communicated it were H. J. Newton and Coleman Sellers, of Philadelphia. These gentlemen have probably papers in their possession which would show that Mr. Anthony antedated considerably those who have claimed to be the original discoverers of the fuming process. If I remember rightly, one of those who claimed authorship in the matter obtained directly from Mr. Anthony's foreman or from the work-room the knowledge of the process.

Will Professor Sellers and Mr. Newton tell us in the next "Annual" all they can of this very interesting matter?

THE FIRST DRY-PLATE AMATEUR.

DEPTH OF FOCUS.

BY CONRAD BECK.

[Before Camera Club Conference, London.]

It is with some hesitation that I discuss the question of depth of focus, as in doing so I lay myself open to being voted a bore. I have thought, however, I would add my opinion to those which have already been expressed in the discussion of this point, which always seems to have been, and I suppose always will be, one of the most prolific discussions in photographic optics. I had a dim sort of idea that it might be possible to focus the matter down to the "Circle of Least Confusion."

Let us state, to commence with, that it will only be necessary in the consideration of this subject to treat of the light that passes through the center of the lens and forms the center of the picture. The construction of the various forms of photographic lenses, the number or shape of the lenses of which they are composed, do not in any way directly affect the consideration. The only factors upon which the question of depth of focus depends, are—1, the focal aperture of the lens; 2, the diminishing power of the lens; 3, the aberration of the lens.

I have here used the word focal aperture to denote the aperture as reckoned on the universal system—that is, the aperture in terms of the focus as $\frac{f}{8} \frac{f}{16}$ etc., but I wish it to be understood here even more exactly than this. In the sense that I use it, it means the actual diameter of the working aperture of the lens in terms of the focus actually in use; that is, if we were using a lens to give a life-size picture, the focus in use—that is, the actual distance from the lens to the photographic plate—would be double the ordinary focus of the lens, and the actual *focal aperture* of the lens would then be only half what it is for distant objects where the principal or real focus is in use. Of course, for all ordinary landscape photography, the focal aperture of the lens is the diameter of the working aperture divided into the focal length $\frac{f}{8} \frac{f}{16}$ and so forth; but for copying, enlarging or portrait purposes we must make use of the definition I have given above.

In the first portion of this paper I propose to neglect aberration; that is, I shall suppose that every lens brings the image of a point on the object to a mathematical point on the picture. Thus we may consider that for this purpose any photographic lens may be represented by a single lens of the same focus and aperture, only presuming that this single lens will accurately bring all the light coming from a point on the object to an exact point on the picture.

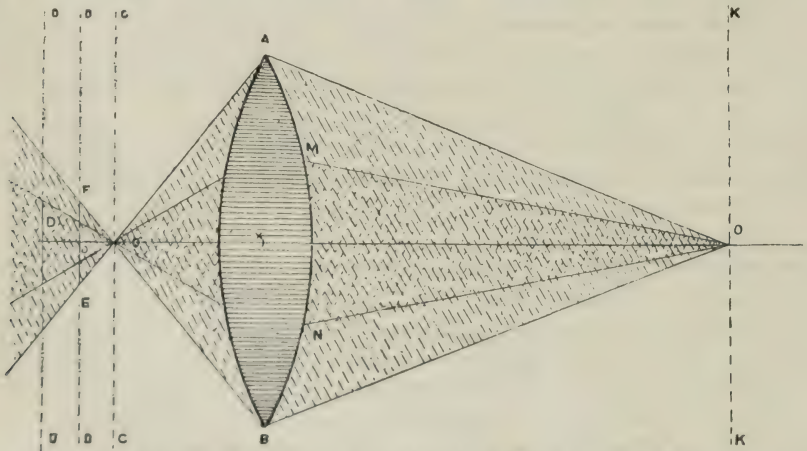
Now let us investigate the cause of our single lens. I have here a lens, and I have on one side of it two candles at different distances from it. What is happening? On the other side of this lens pictures of these candles are being formed in the air. They are not at present visible, but they are there nevertheless. If I put two cards in such a position that the light is reflected from them, we shall see that where these pictures are being formed there are two planes corresponding to two objects, and two only. If I put a third candle in between my present candles, I get a third picture-plane between the two original picture-planes. Every object has a particular picture-plane on which its picture is thrown, and if we take a series of objects at different distances from our lens, and note where their corresponding pictures are formed, we shall notice that a

certain interval between two objects is represented by a certain interval between their picture-planes, and that no two objects at different distances have their pictures on the same plane.

Thus, supposing we were taking a photograph, theoretically only one plane of our landscape could be sharp in our picture, wherever we put the photographic plate. But it is not necessary that the rays of light should come to a mathematical point in order that our photograph should be what we should consider sharp. We do not use a microscope to examine our photographs, and we do not expect to enlarge them more than a few diameters; so that, suppose some of the objects are pictured a minute fraction in front of the plate, and some a minute fraction behind, and some on the plate itself, they may all appear sharp unless very highly magnified. That is to say, owing to the fact that light from a point on the object need not be brought to quite a mathematical point on the picture in order to produce a sharp photograph, there is a certain allowable interval between the picture-planes, and all the objects whose pictures lie within this interval will be sharp on the photographic plate.

Now, on what does this allowable interval depend? I propose to call it the *focal interval*. It depends solely and entirely in a lens free from aberration on the focal aperture of the lens, that is, whether an aperture is in use of $\frac{f}{4}$ or $\frac{f}{8}$ $\frac{f}{16}$ and so forth.

Now, suppose that in figure we have a lens A B, forming an image at C C of an object at K K. The picture that will be formed at O' of the point O, on the object K K, will be formed by the bundle of light contained by O A O' and O B O', and a picture of the object K K will be formed on the plane C C. Let



us suppose the photographic plate be placed at D, the rays which meet at a point at O' will fall on the plate at D, not as a point, but as a circle of light, of which E F is the diameter. Now, provided this circle is quite small when it reaches the plate at O (I should put the largest limit at say .005 inches), the photograph will still, for all practical purposes, show it as a point, though it is not so in reality. That is to say, objects that have their pictures at C or at D, or at any point an equal distance behind the plate, or between these points, will all appear sharp on our photograph. This distance between these points is therefore the allowable difference in focus, or what I have called the *focal inter-*

val. Now, if we reduce the aperture of our lens one-half, the picture O' of the point O is now formed by the bundle of rays included by OMO' and $ON O'$, and the size of the circle of light, when it meets the plate at D , is reduced one-half, and therefore, supposing it is allowable to have our circle of light as large as $E F$, we can take our photographic plate back from D to D' and still get as sharp a picture. Thus, by halving the *focal aperture* we double our *focal interval*, or the allowable distance between our picture-planes.

It is evident that, with every aperture of our lens $\frac{f}{8}$ $\frac{f}{16}$ and so on, we can only have one particular *focal interval*, in order to obtain a particular degree of sharpness, whatever be the focus of our lens.

If the focal interval with $\frac{f}{8}$ be $\frac{1}{4}$ inch, with $\frac{f}{16}$ it will be $\frac{1}{2}$ inch, and so on.

To express this mathematically:

Let a = aperture of lens in inches ($A B$ in figure)

b = distance from optical center of lens to picture of object being photographed ($O' X$ in figure)

c = constant value representing least circle of confusion that will give sharp picture ($E F$ in figure)

$$v = \text{focal aperture} = \frac{b}{a}$$

γ = focal interval = ($2, O' D$ in figure).

Then, by similar triangles, it will be seen that—

$$\gamma = 2 c \times \frac{b}{a} = 2 v c$$

For example, suppose—

$$a = 2 \text{ inches, } b = 8 \text{ inches, } c = .005 \text{ inch.}$$

Then—

$$v = 4 \text{ inches.}$$

$$\gamma = .04 \text{ inch.}$$

It is evident that where we are photographing objects at a distance, the distance b becomes the focus of the lens (f), and the focal aperture of our lens is expressed by the stop of our lens on the recognized system. If we use an aperture of $\frac{f}{8}$, $v = 8$, etc. When, however, we are photographing near objects, the distance b is greater than the focus of the lens, and the rapidity and focal aperture must be calculated from this actual distance, and not from the focus of the lens, as explained above.

(To be continued.)

HOME-MADE CAMERA STAND FOR AN ENLARGING CAMERA.

BY JOSEPH P. BEACH.

[Read before the Society of Amateur Photographers of New York, April 9, 1889.]

THIS stand is a very light affair, made of pine wood, and weighs, without the camera, not more than thirty or thirty-five pounds. It may, therefore, be easily carried by one person to any convenient place for operation.

The enlarging camera—a huge affair, for 10×12 plates—5 feet long, weighs one-third more than the stand upon which the heavier camera is easily put into any desired position.

The accompanying illustrations, with the following description, fully explain its construction. Fig. 1 is a plan view; Fig. 2 is a side elevation; Fig. 3 is an end view. The stand is 4 feet long by 20 inches wide. It consists of six upright legs 2 feet 6 inches long, $1\frac{1}{4}$ inches square, held together at top and bottom by eight 1-inch strips (*A*, Fig. 1), fastened with screws. The bottom is made of

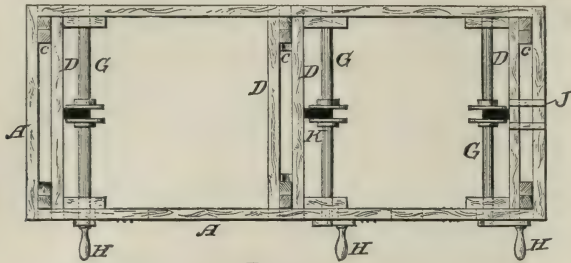


FIG. 1.

$\frac{1}{2}$ -inch pine boards. Within each pair of legs (*B*, Fig. 2) are frames (*C*), each formed of four pieces of wood $1\frac{1}{4}$ inches square. These frames are $15\frac{1}{2}$ inches wide by 20 inches in length. At the top these frames pass through an opening formed by other inch strips (*D*) screwed on the inner side at the top of the leg posts. The bottoms of the frames have on each side other inch strips

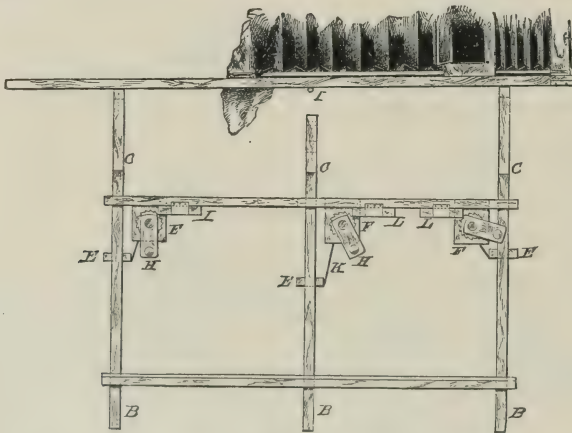


FIG. 2.

(*E*), so that the frames, when moved up or down, are guided vertically and cannot move except in an up and down direction. Upon the sides, at the top, are screwed six pieces of half-inch pine, 4 x 5 inches (see *F*, Fig. 2), pierced with inch round holes. Through these holes run three round wooden curtain rollers (*G*, Fig. 1), having three hard-wood ratchet wheels, and three soft-wood handles (*H*).

The central frame is furnished with two sockets an inch round. Across the bottom of the track of the enlarging camera another inch round roller (*I*) is screwed, three feet forward of the lightest end of the camera. When the camera is placed upon the stand this roller or pivot descends into the sockets. At either end the camera is kept in place by a couple of pieces of half-inch wood (*J*), which permits of a forward or backward play, but no side play. Attached to the under side of each of the three frames is one end of an inch wide leather

strap (*K'*). The other end of each strap is made fast to an inch roller, which is furnished with suitable guides.

To raise the camera, it is only necessary to turn the two forward handles, and when the required height is reached, two wooden bolts (*L*, Fig. 2), an inch square, lock the ratchet wheels at any point. If required, either of the uprights can be raised or lowered to unequal heights, or only the central one raised. Then the camera will be found pivoted at or near its gravity center.

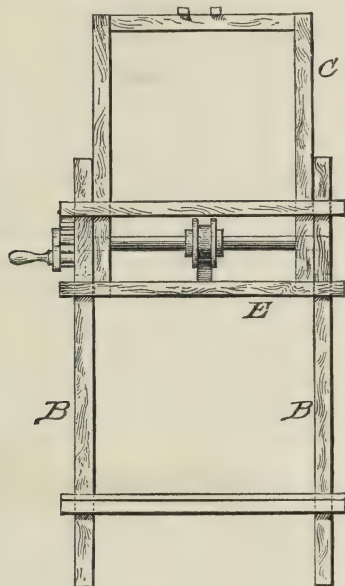


FIG. 3.

Being thus pivoted, the camera may be pointed out of a window at any desired angle in the direction of the sky.

Notwithstanding its very light construction, this camera stand, being put together with screws, is very firm, and admirably answers every purpose for which it was designed. It is to be put upon rollers, and upon the bottom shelf will be erected some light receptacles for the storage of lenses, ground glass, negatives, mats and other paraphernalia useful while the camera is being manipulated for enlarging, reducing or other purposes.

[From Photographisches Archiv.]

AWAY WITH THE OXALATE OF IRON DEVELOPER.

BY DR. J. SCHNAUSS.

THE first gelatine plates were developed here (by addition of ammonia) with alkaline pyrogallol. Like a good many others, I had a great deal of trouble with yellow fog, and the first formula for oxalate developer, received from England, was hailed by me with pleasure, the negatives developed with it possessing much more the character of the old collodion negatives. The oxalate developer at that time was made very concentrated by dissolving dry yellow oxalate of iron (ferric-oxalate) in boiling, cold saturated oxalate of potassium. For that reason the negatives were clear and strong.

But this developer met with no favor among professional photographers on account of its complicated and costly preparation, and the simple and cheaper

developer, as recommended by Dr. Eder, was therefore hailed with pleasure and adopted, while other countries gave the preference to pyrogallic acid.

Since hydroquinone developer has been made known as developer for gelatine emulsion, the largest part of professional photographers as well as amateurs were inclined to favor the same, and in full justice! Is there anything more simple than a hydroquinone solution made alkaline with potash or soda and durable for a long time with a minimum of sulphite of soda? And is there actually a better developer, having no caprices like pyrogallic acid or oxalate?

It is adaptable to all conditions of light and is suitable for all more or less sensitive plates. I have developed celluloid plates of 26 degrees, and an ordinary Warnerke plate of 12 degrees, with the same certainty; yes, even chloride of silver gelatine paper; and much purer and handsomer than with oxalate! And then a pretty large limit is given in the composition of the hydroquinone developer, without material change of the result, if regard is had only to the *age* of the solution. And here we come to another advantage of this excellent developer: it can be used many times in succession, and may be poured back repeatedly into the stock bottle, if only a little fresh solution is added according to requirement. The older the solution, the stronger and clearer the negatives developed with it. A fresh solution develops in the beginning a little too quickly and thin, if acetic acid is not added; whereby, of course, only a part of the alkaline carbonate is decomposed, as care has to be taken not to make the solution acid.

The development of the picture is perhaps a little slower than with the other developer, but it can also be guarded better and the well known remedies be applied against too slow or too quick development. By being able to use the old hydroquinone developer repeatedly, it is very cheap. In the face of all these undeniable advantages of the hydroquinone developer the question arises involuntarily: Why is it that the oxalate of iron remains still in use?

PHOTOGRAPHY AND THE LAW OF ERROR.

BY CAPTAIN ABNEY, C.B., R.E., F.R.S.

[Before the Camera Club Conference, London.]

THE Conference, I hope, will excuse such an uncanny title as that which I have chosen. It looks odd, to say the least, seemingly indicating that photography is subject to errors of some description. I am not going to enter into any optical errors to which it is liable, but only to its inability to render truthfully the gradations of black and white. A question which I have often asked myself is this: In a negative or in a print, do the values in density of deposit, that is, in the translucency of the former and in the blackness of the latter, have any relation to the value in intensity of the light acting to produce such density or blackness?

This question, as I have said, I have very often asked myself, as my writings will show; but it is only quite recently that I have been able to answer the question satisfactorily to myself, and I hope it will appear equally satisfactory to the meeting.

If an initial impact of light has to be given in order that *any* action may be visible on a negative or print on development, we may suppose, after such an impact, that equal increments of intensity in light will give equal increments of action on the sensitive salt; but it by no means follows that the density of de-

posit will proceed by equal increments. As an example, if we take an intensity of light, which we may represent by 1, and another intensity of light, which we may represent by 2, and allow them to act on different parts of the same plate, it by no means follows that on development the opacity caused by the latter will be double that caused by the former. We may look at it in this way: if we have " n " circular discs of very thin metallic silver, and place them at random on an area of a given size, it may be or may not be that some will overlap others; but the chances are much greater that, if we have $2n$ of these discs and scatter them at random on the same area, some will overlap others. Suppose in the case of the n discs none overlapped, but that in the case of the $2n$ discs some did, and if the area of each disc was a and the area of the surface on which they were scattered was A , then in the first case the transparency of the surfaces to light would be measured by $(A-na)$, and in the second, $A-(2na-znk)=A-2n(a-k)$, where k is the amount of average overlap of the discs. Evidently, then, the transparency of the last area would not be twice that of the former. In the same manner, it can be argued that by increasing the number of particles to 3, 4, etc., " n " the transparency would not be proportional to the number of particles scattered. This is exactly what occurs when light acts on a film. The number of particles of deposited silver in a given area are presumably proportional to the intensity of the light acting, but they are in a sense scattered at random over that area, and hence some overlap, and the overlapping increases as the number of particles increases. If this were not so, we ought to have an intensity of light in which absolute opacity is introduced after a certain exposure, which we know is not the case.

Were it so in a Spurge's sensitometer, in which the light admitted to each chamber increases 2^3 , we ought, if we know the size of a particle, to be able to calculate the curve of descent. This can be readily done; for if we measured the transparency of the part of the plate where the intensity of the light was known, then that would give us a measure of the areas of the particles deposited, and we ought to be able to calculate the transparency for any other intensity of light. Thus on a sensitometer plate if the smallest hole gave a transparency to light of $\frac{9.9}{100}$ of the original light falling on it, then we should know that the silver deposit was $\frac{1}{100}$ of the area on which it was scattered. At the fourth smallest hole, where the light acting is double, the silver would occupy $\frac{2}{100}$ of the area, and the transparency would be $\frac{9.8}{100}$; at the seventh hole it would be $\frac{4}{100}$ and the transparency $\frac{9.6}{100}$; similarly the tenth hole would give $\frac{9.2}{100}$, the thirteenth $\frac{8.4}{100}$, the sixteenth $\frac{6.8}{100}$, the nineteenth $\frac{3.6}{100}$ of transparency, while the twenty-second would cause total opacity of deposit.

Now, from absolute measurement we know that such is not the case; the curve which a developed plate exposed in the sensitometer takes is *very* different, as the diagrams show. The curve which the transparency takes is identical with the curve of error of observation, taking for abscissæ the number of the holes and not their area. I may refer you to Sir G. Airy's book on the "Theory of Errors," and there you will find that the probability of an observation being at a certain distance from the truth is expressed by the formula $A'e^{-kx^2}$ where A' is the probability of error and x the distance from the truth.

I should like here to give the measurements of the apertures of a sensitometer made on Spurge's plan, in order to show the accuracy which is attainable by it. The holes were measured by a micrometer made by Hilger, which is capable

of measuring to $\frac{1}{10000}$ of an inch. The following measures were made in $\frac{1}{10000}$ of an inch. The largest hole is indicated as having the highest number. The holes are intended to diminish in area by $\frac{1}{2^8}$.

HOLE No.	THEORETICAL.		MEASURED.	
	Diameter: ten thousandths.	Area.	Diameter: ten thousandths.	Area.
30	4560	1633	4560	1633
29	4017	1267	4063	1296
28	3605	1017	3620	1029
27	3202	814	3220	817
26	2856	642	2873	648
25	2497	491	2560	515
24	2290	412	2280	409
23	2031	324	2030	324
22	1818	260	1810	258
21	1642	211	1610	204
20	1439	162	1436	162
19	1260	122	1280	129
18	1145	102	1140	102
17	1010	81	1010	81
16	894	62.7	905	64.5
15	800	50.3	806	51.0
14	724	41.2	718	40.5
13	650	32.2	640	32.2
12	554	24.1	570	25.5
11	512	20.6	508	20.2
10	465	17.0	452	16.1
9	416	13.6	403	12.8
8	358	10.1	359	10.1
7	305	7.3	320	8.1
6	285	6.4	285	6.4
5	231	4.15	231	4.15
4	217	3.7	226	4.0
3	194	2.9	202	3.2
2	181	2.5	179	2.5
1	158	2.0	160	2.0

The boring of the holes will be seen to be very accurate, and the deviation from what was desired is as small as can be expected. In the very small holes the percentage of error is much larger than in the large ones, which might be anticipated. In my experiments the twenty largest holes were all that were utilized, and in these the error is certainly small enough to be negligible.

I must here put in a word to ask photographers to conduct experiments of this description with as much accuracy as possible. There is a degree of refinement in photographic experiments which is often quite unnecessary; but, on the other hand, the phrase "about so much" should never be used, unless it can be shown that such an approximation is sufficient.

Let me explain how the experiments were conducted. A gelatine or other plate was placed in the sensitometer and exposed for a given time to the light from an equally illuminated surface. It was developed and placed in the apparatus for measuring the transparency of deposit as I have recently described. The number of the holes was then placed as the scale for the base of the curve, and the transparency of each set up as an ordinate; a curved line was drawn through the extremities of these ordinates.

In the formula $\Delta = \Delta e^{-kx^2}$, x was the number of holes from the first hole

in which the action of light was apparently *nil*. To find k , x was taken some way down the scale, and the value of A' (which in this case was transparency of deposit) was taken from the curve A , the total transparency was also known. This gave k . Using this value of k , the transparency of deposit was calculated for each ordinate, and, as before stated, the resulting curve was found to agree with that plotted.

I cannot say exactly at the present time why the formula does apply to photographic plates, though the theory would seem to point to a connection between the transparency and deposit in the way I have indicated. Professor Rücker and myself have both had a try at the adaptation, but have not yet finished our investigations. It is, however, none the less true that the formula holds good when a negative is developed, or when a platinum print is developed, allowing for the light reflected from the platinum as well as from the background of white paper, as the examples I give show. But it does not hold good in the case of a silver print, for reasons which, I trust, you will appreciate. When light acts on chloride of silver it blackens it, and after the first short impact of light, of course, the subsequent light has to struggle through the various intensities of blackness to reach the silver salt below, and this must necessarily modify the result. On the other hand, when a plate is exposed to light, the change in color is so small that practically the light has only to struggle through the silver salt in its pristine state. The same applies very nearly to a platinum print in which the change in color of the iron salt is small.

In the appended table are two examples of the theoretical and observed curves, one being a gelatine plate and the other a platinum print.

BROMO-IODIDE GELATINE PLATE.			PLATINUM PRINT.		
No. of hole.	Observed Transparency.	Calculated Transparency.	Abscissæ (No. of holes).	Observed reflected light.	Calculated reflected light.
1	124	—	1	45	45
3	118	117	2	45	45
4	114	111	3	44	43.7
5	105	103	4	42	42
6	94	92.5	5	40	40
7	83	81	6	37.5	37.5
8	71	70	7	35	34.6
9	59	59	8	32	31.7
10	50	48.6	9	29	28.8
11	39	38.7	10	26	25.1
12	29.5	30.6	11	22	22
13	23	23.1	12	19.5	19.1
14	17	17.5	13	17	15.9
15	13	13.3	14	13.5	13.3
16	9	9	15	11.5	10.9
17	7	6.5	16	9	8.9
18	5	4.4	17	7	7
19	3	2.8	18	5	5.6
			19	4.5	4.5
			20	3.5	3.4

In the formula :

$$A' = A\epsilon^{-kx^2}$$

$$A = 124$$

$$k = .0116$$

In the formula :

$$A' = A\epsilon^{-kx^2}$$

$$A = 45$$

$$k = .0072$$

[From Photographisches Wochenblatt.]

DEVELOPING BROMIDE OF SILVER PAPER.

BY F. STOLZE.

THE use of bromide of silver paper in its application for enlargements increases daily, and the question of the mode of its development obtains therefore a considerable significance. This will still more increase when glossy bromide of silver paper is better known and more generally introduced in the market. There is no doubt that this will be the case, the handsome neutral tone, in connection with great brilliancy, making the paper excellently suitable for the smaller portrait sizes. In character they are fully equal to the ordinary photograph, although deviating in color somewhat, and with regard to sharpness, linear fineness, clearness of the high lights and depth of shadows they even surpass them.

Presumably the development of bromide of silver paper should offer no particular difficulties, everybody being acquainted with that kind of work by the development of dry plates, and particularly in Germany, where the oxalate developer is still principally used for negative purposes, it should be considered the easiest thing in the world. But exactly the contrary takes place. And this can easily be accounted for, if it is considered that some conditions arise which are quite immaterial in the negative process.

Of both—enlargements as well as negatives—we require strength and softness; but while the latter have to show these properties in their transparency, they have to be embodied in the picture on the former. Further, while in negatives the tone has no particular function, it is of the greatest importance for positives; and while finally a slight fog on negatives is in a good many cases even much liked, it is entirely inadmissible for positives. As now all these conditions for positives are disregarded in the development of negatives, it can easily be explained that frequent complaints are made about failures. To this may be added the circumstance, that all the papers heretofore introduced in the market required different treatment, and that besides this, certain conditions were demanded by the several formulas, which are by no means a necessity.

I am not mistaken, I think, by asserting that all specified formulas mark the application of soluble bromide salts hitherto a *conditio sine qua non* for obtaining strength and a good tone. This, however, has to be declared decidedly as a mistake. In an actually successful preparation strength and tone will come out best if the exposure is such that bromide is not at all required; hence it is supposed that the negative is not too thin. In the latter case bromide has to be added to retard the high lights sufficiently long that the deep shadows can obtain the necessary strength. In every other case the addition of bromide for paper of first quality should be avoided. I know that it is difficult to obtain such a paper of uniform quality, and I know this from my own experience.

But even where the paper will not give sufficient strength without the bromine salt, it is the rule that the quantity of the same should be held back as much as possible in the interest of the tone. Under all circumstances, therefore, also with best paper behind thin negatives, so much exposure should only be given as is needed either to obtain the necessary strength or for the development of all details, while the bromide addition is suited to the time of exposure, and not reversed. If we overstep this line the tone will suffer under all circumstances, and we are forced to apply various expedients for fixing, the details of which I will explain further on.

To find the correct time of exposure is therefore of more importance for enlargements on bromide of silver paper than for the production of negatives. While for the latter too dense a deposit necessitates only a longer time of printing, it would make a positive unfit for use. Here, therefore, is the essential point, and it is my opinion that the general interest of photography will hereby be promoted. During the period of wet plates one was required to expose correctly. In this regard the gelatine plates have led to an indifference which can only be deplored, because the results are not only influenced injuriously, but because in consequence of the same the fine judgment for correct valuation of light is lost more and more. We over-expose simply "out of caution" and rely on bromide of potassium. But positive photography upon bromide of silver will make an end to this pretty soon.

Now we do not want to say that an exposure strictly correct to within a hair's-breadth is indispensably necessary. Even if we double the exposure, a relatively good picture can still be obtained by a simple stopping of the development and without greater addition of bromide of potassium; it is surprising how large a limit there is in this regard in the time of exposure. But just on account of that we should be very cautious with the addition of bromide of potassium. I place so much importance upon this point, because I know from experience that many photographers are so fully convinced from the application of bromide potassium that they disregard the advice to work without it, and declare they know better. To be sure, some of the papers in the market cannot be used without the bromide of potassium, and are beforehand subject to so much chemical fog that without this addition a picture with clear whites and deep shadows can never be produced. But even here one should be very cautious, and not believe that by continually increased addition of bromide of potassium a brilliancy could be forced. That is impossible. The modification of the bromide of silver in these papers is such that it does not give an actual black, but always is more or less dark gray, which, by longest exposure with greatly increased addition of bromide of potassium, does not become darker, but only more greenish. It is, therefore, here also necessary to await the proper period of time at which the shadows become still darker with the aid of a certain addition of bromine salts during development. Increased exposure and more bromine salts will then both act injuriously. The depths, which in such a manner cannot be obtained photographically pure, have to be put in afterwards by retouching. As this concerns always only the dark shadows, the fine half tones of these papers being always very handsomely delineated, they will always give good results for well retouched pictures. Without the same they will always have an unfinished and weak appearance.

In the development with oxalate it is necessary, as is well known, to put the pictures in weakly acidified water, if a yellow coloration is to be prevented. But many mistakes are made here. Thin negatives, to obtain the greatest possible strength in the developer, are worked with a great deal of iron; in extreme cases with one of iron solution to three oxalate, concentrated solutions. If we dilute a sample of this mixture with water we will find that it will darken after a short time with formation of a yellow precipitate. This takes place, if a little slower, by diluting with the ordinary acidified water. The cloudiness, however, even takes place sometimes with one of iron to five oxalate, only that a longer time is then required. This explains now why under certain circumstances a yellow

coloration of the pictures takes place in spite of all acid baths. This happens with a developer containing a great deal of iron, and with films which wash very slowly on account of the hard gelatine. In such cases, if too serious, an increase of the acid to double or three times its quantity in the first water will help; but if this is not sufficient, the picture should first be put in a pure oxalate solution, left for a few minutes therein and then washed with weakly acidified water.

Many of the papers in the market have such a soft gelatine coating that this can be injured very easily, and in a wet condition a touch of the finger is often-times sufficient to melt it. Although this condition is very inconvenient during the manipulation, it still offers the advantage that the above mentioned yellow coloration happens much less, because the film washes much easier. After fixing and excessive washing out of the fixing soda, care should be taken, under all circumstances, for a toning of the film, in case the application of an alum-fixing bath is not preferred.

This leads me to a point already mentioned. One is able to essentially influence the tone of a picture in the fixing bath which became green in the development. The most simple means for this is based upon the well known toning action of the fixing bath. The picture is left therein for about half an hour and the tone will be found considerably improved. The mixed alum fixing bath acts in this respect much more energetically, the pictures assuming a more bluish tone after a proportionally short time. Still quicker than this bath acts the tone fixing bath introduced by me for chloride of silver paper, in which even very green pictures, after complete fixing, will obtain a handsome tone. The composition of the tone-fixing salt being not sufficiently known yet, I will publish it again at this opportunity. Dissolve 35 parts hypo soda, 9 chloride of sodium, 4 alum, 2 ammonium sulpho-cyanide in 150 to 200 water. The solution, which has a whitish color and is thick, ripens in warm weather in about four days; during the winter one week is required. The bath is decanted from the sediment or filtered. The undissolved, crushed, well mixed salt ripens also in this condition, so that it can be kept in stock. Immediately before use add a few cubic centimeters of chloride of gold solution 1:50 to the bath. The bath will keep for several weeks. If it should not work so energetically after some time, about 10 cc. concentrated alum solution per liter are added to the same. If a black sediment should form in the bath after awhile, it is a sign that it is saturated with silver. This is then precipitated in the manner described by me with sulphuret of potassium, avoiding a surplus of this salt, and the filtered bath can be used anew.

To give a fixed, standing formula for the oxalate developer is not recommendable. Proper judgment, according to conditions, has to be exercised, and relatively more or less iron has to be taken to the oxalate, having always in view that less iron will also give less soft pictures. I myself prefer to work with one saturated iron solution to five saturated oxalate solution, and I apply only with reluctancy a stronger developer on account of the above-mentioned yellow coloration. For weaker developers a dilution of this mixture is mostly sufficient; but as there exists still a certain danger of this discoloration, I increase the oxalate a little, and only after that I add pure water.

If several pictures have to be made in succession, the stronger parts should be developed first, afterwards the weaker pictures, by adding a little fresh developer. In this way from five to six pictures can be finished in the same solution.

This is about all that I have to say about the oxalate developer. In the next number I shall speak about the hydroquinone developer, which is in the advance now, and has such advantages that yellow pictures, which so frequently occur with iron, are completely excluded.

(To be continued.)

A METHOD OF MAKING DARK BLUE-PRINTS.

BY CHARLES J. BATES.

[Read before the Society of Amateur Photographers of New York.]

It must be said that to obtain any final result some drudgery is inevitable. The hunter who depends on the game he kills or the fish he catches for his living, kills and catches in the best or easiest way he may, cleans and packs the results, considering that as part of the work in preparation for the market, where he gets his profits. But the true sportsman has a feeling of satisfaction in having made a good shot on the wing, or skillfully tired out an obstreperous fish, and derives an additional pleasure in the contemplation of a fine buck or a fish that will suggest a story bigger than itself; but this same sportsman will frequently rather give away his game than even take the trouble to carry it home. It is a trite simile to compare a photographer to a sportsman, for that has often been done; but in the home work of the photographer there is much that has no parallel to the efforts of the sportsman, except maybe in the feeling of satisfaction over the results. Many persons carry their cameras far to get a picture. Having "pressed the button," they take no further interest in the matter until the finished print is placed in their hands. I have known others "stalk" a picture, study this view and that view, and if the case is difficult, with irregular or uncertain lighting, they will study the development with a care almost inconceivable, and having finally secured a good negative it is a matter of entire indifference whether they ever make a print. The majority of persons, however, who take an intelligent interest in photography, like to see the positive that may be compared to the original. This has led the writer to try to find some way to secure a print that will be pleasing in tone and simple in manipulation. From some hints derived from an old book the "blue-print" was tried nearly thirty years ago, but was discarded for reasons now well known. Many other experiments were tried, the latest being the following, the results, however, not being eminently satisfactory. But the writer is cheerfully willing to give his game away rather than to carry it home. Some experiments, as well as the known fact, proved the hopelessness of any attempts to change the blue color of the blue-print except by operations making the result more trouble than it was worth, or at least to entirely destroy the simplicity sought for.

It took little observation to discover that the blue color was transparent, so it occurred to the writer that the blue could be combined with another color that would result in a more satisfactory tone. The nature of the solar spectrum at first suggested using orange (orange being complementary to blue); so by making blue prints on orange colored paper a very good tone was secured, but with the very serious objection that the high lights retained the orange color. Other papers were tried; but the best results came from a gray paper, which gave a very good blue-gray tone, with the same objection, however, that was found to the color of the high lights, though not so serious as in the case of the

orange. It then occurred to the writer to ask, could not some substance sensitive to light be used that would give a color where color was wanted, and on washing would leave the lights white or nearly so. The only substance at present known to the writer is bichromate of potash. This is nearly as sensitive to light as the blue-print, and as it was a hopeless or at least difficult task to make a bichromate print first and then a blue-print correctly over it, a series of experiments were tried by mixing the bichromate with the blue print solutions in various proportions, as shown in the table.

It being known that a saturated solution of bichromate of potash spread on paper would make a clear print of a strong yellowish brown tone, Solution 1 was tried. The resulting paper proved very insensitive to light, due, no doubt, to the failure of the solutions to soak well into the paper. The outer surface was affected by the light protecting the substrata so that unless exposed for a long time the picture all washed off. This was largely obviated by adding water as shown in Solution 2. The resulting tone here being too blue, the amount of bichromate was increased as shown in No. 3, but with the same objections that were found to No. 1, so further dilution was resorted to, as shown in No. 4; but the color being still too blue and having learned a lesson from No. 3, a reduction of the ammonia citrate of iron was tried, as shown in No. 5. The above general principle was carried on as shown variously in the succeeding solutions. Want of time has prevented further experiment; but the writer thinks that by using a stronger solution of the red prussiate and proportions like those in the latter part of the table, good results might follow:

TABLE OF PARTS OF SOLUTIONS USED FOR EXPERIMENTS.

	NUMBERS OF EXPERIMENTS.																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
a. Saturated solution potash bichromate (fluid drams).....	1	1	2	2	2	2	2	2	2	4	4	3	4	6	6	4	2	4	3	3	2	2	3	3	2	2	2
b. Water (fluid drams).....	0	2	2	3	3	4	4	4	4	4	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
c. Solution red prussiate potash, 1 in 10 (fluid drams).....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	4	6	4	4	4	4	4	4	6
d. Citrate iron and ammonia (grains)	40	40	40	40	30	30	20	10	10	16	20	20	20	40	40	12	12	12	12	0	4	4	4	2	6	8	4

A large number of prints were shown as examples of the different experiments.

[Written for the "International Annual."]

TRANSPARENCIES IN PRUSSIAN BLUE.

By ROBERT BENECKE, *St. Louis.*

SELECT glass free from scratches and bubbles, put it in a solution of washing soda awhile, wash it and set it up to dry. Now take 1 ounce of fine gelatine, such as is used for making dry plates, put it in clean water, wash it a couple of times, squeeze out the water and place it on a clean towel. After about one hour dissolve the gelatine in 20 ounces of hot water, and filter it through cotton, flannel, silk, buckskin or cotton pushed into the neck of a funnel. Coat the plates with the gelatine solution warmed to 120 to 140 degrees F. In cold weather it will be necessary to warm the plates. When the solution is spread evenly over the glass, lay it on a cold marble slab placed horizontally, and as soon as the coat-

ing has become stiff enough not to run any more, set them up on nails to dry. This will take from eight to twelve hours or more. Any number of plates can be prepared this way and may be kept for any length of time in a place free from dust. The next is to mix the sensitizing solution. Dissolve citrate of iron and ammonia; $7\frac{1}{2}$ drams in 4 ounces of water, also ferri-cyanide of potassium, 5 drams in 4 ounces of water. Mix and filter into a dish and immerse plates for about five minutes, avoiding air bubbles. This is better done in the evening by lamp-light. Next morning they will be dry, and ready to be placed under the negative and into the light. Time for printing required is about double of that for albumen paper. The last thing to be done is washing, which removes the salts and develops a rich blue print.

The solution must be made fresh, as it will not keep very long after being used. The plates will keep in the dark for some time.

The idea of making blue transparencies was suggested to me by my friend and enthusiastic amateur, R. Bain, President of the St. Louis Camera Club. He proposed to add the salts to the gelatine solution, but it would not work, as the citrate of iron and ammonia would immediately coagulate the gelatine.

I hope that your readers may enjoy this novelty; it is all I had to offer as a contribution to your valuable Annual this time.

DARK ROOM LIGHTING.

BY P. ERSLEY.

Do different kinds of light affect different eyes in a different way? I commenced using the ruby light. Finding it injured my eyes, I next tried the yellow light. Not liking it, I tried yellow and green, and can say it exactly suits me, and I think if those using ruby or orange will try hanging up a sheet of green tissue paper before the window on the inside of the dark room, they will find, as I have, that it gives a very pleasant light to work by, not at all trying to the eyes, and far superior to either of the others in enabling them to conduct the development with more certainty and uniformity.

OUR ILLUSTRATION.

WITH this issue of the BULLETIN we present our readers with an illustration showing the Paris Exposition now in progress and the great Eiffel Tower. We have seen no view that gives a better idea of the height of this enormous iron structure. Our thanks are due Mr. G. Cramer, who kindly furnished us the French newspaper (*L'illustration*) drawing from which the photo-mechanical print was made by Mr. W. Kurtz, of New York. When we state that the original is over thirty by forty inches in size, the beauty of the reproduction can be better appreciated, and the honor is due to Mr. Kurtz' process.

ANOTHER VETERAN.

To the Editors of the BULLETIN:

In your last issue I noticed a dispute between Mr. Notman and Mr. J. A. Palmer with regard to being your oldest living customer. I claim to have taken the first views which were produced of the Thousand Islands, River St. Lawrence, in 1855, from Sidney Jones's, Brockville, Ont., with a camera made by Mr. E. Anthony, purchased through Mr. H. S. Wruphrey. Mr. Wruphrey fur-

nished the camera box, which is still in existence. The views were on dry plates made by the albumen and honey process; exposure required, five minutes; size, 16 x 20. These views have never been surpassed for detail and brilliancy, being the first published in Europe in 1860, giving emphasis and accuracy to the illustrations of the Thousand Islands, River St. Lawrence.

A. C. McINTYRE,

Alexandria Bay.

We have also received from Mr. J. A. Palmer two half plate ($4\frac{1}{4} \times 5\frac{1}{2}$) daguerreotype views, which are excellent pieces of work. They are instantaneous pictures, full of detail, and were taken during the year 1855.—Eds.

TRIP TO BOSTON CONVENTION.

A CAPITAL chance to escape from the heat of railroad travel, but get there just the same, is to take advantage of the special excursion from Philadelphia on the steamer "Norman" and enjoy the cooling breezes of the sea instead. All that go by this most delightful route will have plenty of time to get sea-sick, being forty-eight hours on the ocean.

If you want to join us on this voyage, make up your mind quickly, as this is a very popular summer route, and the staterooms are always taken for weeks in advance. The fare for the round trip, including meals and berth in stateroom, is only \$18. The "Norman" sails from Philadelphia at 12 o'clock noon Friday, August 2d. If parties desiring to go will advise us before July 10th and send check for \$18, we will obtain the tickets and staterooms for them.

BUCHANAN, BROMLEY & Co.,

1030 Arch street, Philadelphia.

P. S.—I have made this trip several times, and can testify that it is a most delightful voyage, with gentlemanly officers and crew, plenty to eat and drink, and a good opportunity to look out for whales and sharks. For my part, I would not go by any other route.

W. P. BUCHANAN.

ANTHONY'S PRIZES FOR BROMIDES.

OUR publishers offer for competition at the Boston Convention of the Photographic Association of America, August 6 to 10, 1889, the following prizes for the users of Anthony's Reliable Bromide Paper :

For the best collection of Plain Enlargements and Contacts.....\$100

For the best collection of Crayon Worked Enlargements..... 50

The conditions for competition will be as follows :

First—For the \$100 prize the prints must be at least six in number and must embrace both Contacts and Enlargements.

Second—The awards will be made for the best collection as a whole.

Third—Competitors must forward their exhibits prepaid so that they will reach Boston by the first of August.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a card stating the name and address of the exhibitor and his private mark, a letter being sent also with same private mark, but on no account must any other than the private mark appear on the pictures

themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. Applications for space must be sent to the Secretary of the Association, Mr. O. P. Scott, 2220 Indiana avenue, Chicago, Ill.

E. & H. T. ANTHONY & Co.

AIR BRUSH MANUFACTURING COMPANY'S PRIZES.

THE Air Brush Manufacturing Company will offer the following prizes at the Convention of the Photographers' Association of America, to be held in Boston, August 6 to 10, 1889:

First.—One complete Air Brush will be given for the best free-hand portrait done with the Air Brush. This may be in black and white or water colors.

Second.—One complete Air Brush will be given for the best water color portrait, over any print, finished with the Air Brush.

Third.—One complete Air Brush will be given for the best portrait in black and white, over any print, finished with the Air Brush.

GOOD WORDS FOR "INTERNATIONAL ANNUAL."

EVERY year there is published by E. & H. T. Anthony & Co., of this city, an International Annual with the idea of giving the new improvements in apparatus and developers in photography and showing what advance is being made in the science. The number which has just been issued for this year will be found most interesting by those who have a liking for the camera and its work. Unlike the British Annual, it is not made up mostly of advertisements, but contains 479 pages of reading matter. The book is illustrated, and contains a fine photographic study of a girl by Falk, printed on Bradfisch aristotype paper, as a frontispiece. Other pictures give an idea of the methods of printing nowadays.

The Annual is edited by Arthur H. Elliott, of the United States, and W. Jerome Harrison, of Birmingham, England. Among the contributors are almost all the prominent writers on photographic subjects. The purpose of the publishers has been to tell what is new in a series of well written articles on the various subjects, as well as a few sketches in a lighter vein. To the novice in the art the instructions therein contained will be of value. To the reading matter is also added a directory of photographic societies and a series of tables of needful formulas to the picture-maker.—*N. Y. Times*.

It is an attractively gotten up book.

Yours truly, FALK.

At a glance I can see it will not only be interesting, but very instructive.

LIEUTENANT C. L. BRUNS, *U.S.N.*

I do not think any other Annual can ever pretend to compete with it for fullness and excellence of information.

TALBOT ARCHER, *England*.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

CLINTON HALL, 19 ASTOR PLACE, N. Y.

REGULAR MEETING, JUNE 4, 1889.

President NEWTON in the chair. Communications being first in order, Secretary Mason read the following :

NEW YORK, May 20, 1889.

Photo Section American Institute, O. G. MASON, *Secretary*.

Dear Sir :—We send herewith a photograph of Miss Ellen Russell, negative made by Mr. J. F. Ryder, Cleveland, O., on our plate. Please accept it, with our compliments.

Yours truly,

M. A. SEED DRY PLATE CO.

The Secretary also read the titles of the photo journals and papers received since the last meeting, all of which were duly acknowledged by a vote of thanks.

A special vote of thanks was tendered to Mr. M. A. Seed for his valuable contribution, and the Executive Committee was requested to give it a prominent place among other

choice examples of photographic art that already adorned the walls of the Institute.

The reports of Committees were next called for, and Mr. J. B. Gardner, the chairman of the "Annual Field-day and Dinner Committee," proposed that the outing and dinner take place at Brighton Beach, Coney Island, August 27, 1889, and that the dinner be served in the Hotel Brighton, at 4 o'clock P. M. This proposition was seconded and confirmed by a numerous vote of the Section.

The chairman invited all members of the Institute and their friends to unite with the Section and participate in the feast on the above named occasion. All who thus desired to join with them could obtain tickets by addressing either the clerk of the Institute, D. L. Garden; Dr. A. H. Elliott, 591 Broadway; O. G. Mason, 403 East 58th street, or J. B. Gardner, 147 Fulton street, New York, N. Y.

A resolution was passed that when the Section adjourned, it adjourn to meet, not only at the Hotel Brighton, on the last Tuesday in August, but in the lecture room of the Institute on the Tuesday following the excursion. The chairman then announced that the programme of the evening would be an exhibition of Centennial slides contributed by members and friends of the Section, and the first contributors he should have the pleasure of introducing were the Messrs. Simpson, both prominent members of the New York Photographic Society of Amateurs.

Each of these gentlemen exhibited twelve pictures that called out the frequent applause of the audience.

These pictures were followed by a large collection made during the three days of the parade by President Newton.

These were followed by an equally large number made by Professor Elmendorf.

There were also slides contributed by Messrs. Lightowler, Fisk, Mason and Faris.

The whole number of pictures exhibited during the evening was two hundred and twenty.

The stereopticon was managed by Messrs. Fisk, Lightowler and Elmendorf; and by this combination were probably exhibited more pictures in a given time than can be found on record.

This collection of pictures, as a memorial of the Centennial, will, no doubt, as time passes, continue to increase in interest; for they will remain as one of the most tangible proofs of a display never before equaled in this country or perhaps in any country.

Of all the thousands of pictures that were taken on this memorable occasion, few could be found, perhaps, that would exhibit more skill, more artistic taste and painstaking labor than those presented to the Section; and that they were duly appreciated by the large audience present, was quite manifest by their frequent and hearty applause.

At the usual hour the Section on motion adjourned.

CHICAGO LANTERN SLIDE CLUB.

MAY 21, 1889.

ALTHOUGH a cold and rainy night, a large number of the members assembled at the Sketch Club rooms, in the Art Institute, to enjoy the lantern exhibit from the Interchange set of slides sent by the St. Louis Camera Club.

After a pleasant informal discussion on lights for lantern purposes, the *President*, Colonel STEVENSON, called the meeting to order at 8.30 P. M.

The minutes of previous meeting were dispensed with. Eleven new members were elected.

A report from the Committee on Illustrated Chicago was read, and the President suggested that we make use of negatives from views before the fire of 1871, so as to present the past and the present. Dr. Nicol then occupied a little time in testing lanterns and describing the light used. He claimed that the light is the mainspring of the lantern; the best objectives and condenser were worthless without a good light. There was a great desire to find a lamp giving the maximum of luminosity with the minimum of heat. Experiments in that direction had not succeeded as he desired, most makers seeming to forget or overlook the fact that the rays of light falling on the condenser at an angle would be converged and brought to a focus at a certain point in the distance, and only a small portion of an expansive light could be utilized in the condenser. For this reason, instead of three or four wicks in a lamp, the Doctor held that one argand light of even power and whiteness would give the best illuminated disc. He then showed the Ives Fairy Lantern, designed for the oxy-hydrogen light, a little pocket-piece, or, more properly described, about like the Waterbury or Anthony 4 x 5 Detective Camera. This unfolded and with rigid form held the entire apparatus for projecting a picture suitable for Central Music Hall.

After this interesting exhibition, Dr. C. F. Matteson proposed the name of Mr. H. H. Bennett, of Kilbourne City, Wis., as an honorary member of the Club. In offering this motion, he remarked that Mr. Bennett, in his position at the Dells of the Wisconsin River, had done many favors for the members, as also on that exceedingly interesting evening, with his beautiful slides. The Club unanimously voted the honor, and the Secretary was instructed to notify Mr. Bennett.

The St. Louis set of slides then proved a rare treat. Doctor Nicol assured the audience that he felt pleased to notice so many of the slides matted for the particular picture; and that while some might call him a crank on mats, he was satisfied in his position and claim that a true artist would frame his subject artistically. The Secretary operated the McIntosh lantern, and the Doctor interested the audience with the praises of each slide. Especially mentioned were those by Messrs. Dunn, Bain, Rev. Charoppin, and Butler.

We feel that the management of the American Lantern Slide Interchange is productive of much good, and the lantern exhibits from each set are hailed with delight.

W. A. MORSE,

Secretary.

HARTFORD CAMERA CLUB.

FIFTH ANNUAL OUTING, MAY 30th.

THE destination of the party was the extension of the New Haven and Derby Railroad, along the line of which, by invitation of the railroad company, it was the intention of the photographers to cull from nature many of the choice bits of beautiful scenery there presented to view.

The special made its first stop at the rock cut, just outside of the city. Next the big bridge at Derby became the focal point of many lenses. From here the train ran to the Ousatonk dam and a short distance further on the Indian Well came in for its share of the "shots." At the unique trestle-work bridge an hour's halt was made and nothing in the vicinity worth photographing was slighted. At Stevenson's luncheon was provided and served by the ladies.

Botsford was reached about half-past three and very little work could be done there because of the heavy rain. The train soon started on the homeward trip, and after a stop at Emerson's mill, to permit a shot or two at the old ruin, proceeded to this city, which was reached at six o'clock.

Altogether, three hundred and fifty-three exposures were made. It was decided that an album should be made up from the negatives secured on the outing and be presented to the railroad company as a mark of appreciation of the courtesies extended to the excursionists.

Those from Hartford were Mr. and Mrs. A. H. Pitkin, William Pitkin, Elmer M. White, Dr. and Mrs. G. L. Parmelee, H. O. Warner, J. C. Hills, Miss E. M. Day, Mr. and Mrs. Elisha Risley, the Misses Risley, Dr. and Mrs. H. G. Howe, Mr. and Mrs. Henry Fuller, Elmer Quiggle, Mr. and Mrs. W. E. Whittemore, C. R. Nason, Miss F. E. Spencer, Fred D. Berry, Miss E. M. Harrison, T. W. Hooker, George W. Burch, F. A. Thompson, Mrs. A. Butler, R. W. Ney, F. G. Warner, Fred. H. Chapin, Miss Chapin, Arthur R. Thompson, Miss Weaver, Miss Mill, Miss Howard, Miss Bunce, Mr. and Mrs. Hinman and W. W. White.

Those from Springfield were: Mr. and Mrs. C. C. Parkhurst and Mr. C. A. Emery.

The Meriden contingent was Rev. A. H. Hall, Charles S. Sidell, Mr. and Mrs. George A. Fay, Miss Upson, W. A. Webber, J. H. Chase, Dr. T. S. Rust, William Savery, George Ellsbee and R. A. Palmer.

From New Haven were: George DeForest; J. P. Hopson, Superintendent New Haven and Derby Road; F. A. Jackson, J. F. Malone, Fred. E. Hotchkiss, T. Joseph Chatterton, E. R. Slater, Miss Darrow and Miss Gower.

From Waterbury came E. H. Everett, George Chapman, William Young and Charles R. Pancoast.

Mr. Pancoast carried with him a camera which has seen service during the past seventeen years in every quarter of the civilized world.

ST. LOUIS CAMERA CLUB.

ST. LOUIS, June 4, 1889.

President BAIN, with seventeen members, present.

The minutes of the last meeting were read and adopted as read.

Applications for active membership from Mr. Arthur H. Zeller and Mr. Dave B. Aloe were read and referred.

The notice of the appointment of Frank J. Hickman as Assistant Secretary, in accordance with the resolution adopted April 2d, 1889, was read.

Mr. Harry L. Bauer was unanimously elected to active membership.

The report from Father Charropin upon the progress of the slides for "Pictorial St. Louis" was to the effect that forty of them had already been made, which would be exhibited at the next meeting; and that he only had about half of the negatives named on the printed list.

President BAIN explained the process of making blue-print transparencies, which was as follows: Coat a clean plate of glass with gelatine and allow it to stand until dried hard. Be careful in handling, as the gelatine will not take the solution where there is a finger-mark on it. Flow the plate with the ordinary blue-print solution, which should be allowed to drain off by standing the plate on end. When perfectly dry, print in the usual way.

The meeting adjourned at 8.55 P. M., after which the set of slides of the London Camera Club were exhibited.

W. M. BUTLER,

Secretary.

THE CHICAGO EXHIBITION.

WE take the following account from the *Chicago Herald*, kindly sent us by Mr. Gayton A. Douglass:

"Well, 'Doc,' what do you think of it all?"

The reporter and "Doc" had been spending a leisurely hour in the rooms of the art institute, chiefly with the exhibition of the photographic society. "Doc," it may be stated, is a garrulous old Chicagoan who affects to be a connoisseur in the arts.

"It is capital, sir. The two exhibits by J. W. Buchler, who is a banker on Randolph street, constitute a very admirable collection of photographs, ranging all the way from Florida groves and light-houses to Chicago suburban homes. Dr. H. A. Johnson, of Sixteenth street, whose son, Dr. F. S., is an enthusiastic amateur, has also scored a success in his dozen of Florida views. Moses L. Scudder, Jr., of the Chicago, Burlington and Quincy Railroad, has given some very interesting studies from his recent Mexican trip; those bull-fight views and groups of Mexican Indians are worth a volume of written description. What can be nicer than to bring the camera along on such holiday trips as those to Florida, Mexico or other lands? Just now it is quite the thing, too, for I notice that young Higginbotham and others who recently left town for Europe were equipped for making pictures. Among the ladies, several of whom are represented in the exhibition, a conspicuous place must be given to Mrs. H. E.

Stevenson, for her California mountain scenes. Mrs. Hattie Bradwell, daughter-in-law of the Judge, is represented by two air brush portraits, very well executed, and it is said that the home of the family, on Michigan avenue, has almost become an art gallery from the numerous productions of herself and husband, Justice Bradwell, and the parents of the latter. You know the old Judge himself has prepared pictures for his own paper, the *Legal News*, and is versed in all the mysteries of photographic reproduction. Mrs. Bartlett, wife of the famous chemist, has also some excellent studies by the Pizzighelli platinum process. That is a new idea—modification of the Willis & Clements method—and gives a fine steel engraving effect, while it is apt to be much favored by society people on account of its not requiring much handling of chemicals or soiling of their delicate fingers. Another lady amateur, Mrs. F. A. Delano, of Edgewater, has furnished some good specimens of portraiture and holiday scenes. Then there are the exhibits of Lawyer J. P. Gardner, forty fine views by W. H. Gardiner, about as many by Fred K. Morrill, suburban views by James Colegrove, and collections by Dr. C. F. Matteson, E. Burton Holmes, Messrs. Fowler and Dupee, of Kenwood, Robert P. Harley and Ben Manierre, all so many creditable evidences of local amateur talent."

"With people like these so interested in photography Chicago cannot well fall behind?"

"I should say not," resumed "Doc," "and the best of it is the actual exhibitors form but a fraction of our host of amateurs. Professor G. W. Hough, of the Dearborn Observatory, is an accomplished photographer; so is General Arthur Ducat, of the Home Insurance Building—he has fitted up an elegant gallery in his residence at Downer's Grove—and so is Broker Jamieson, of LaSalle street, brother of the Judge. Then there's Dr. H. D. Garrison, of the Chicago College of Pharmacy, a thorough chemist and always willing to solve a problem for the comrades of photography, while there are any number of surgeons and physicians among us—not to speak of architects, engineers and railroad men—who employ the art as their familiar interpreter and professional aid."

"The same devotion to photography seems to prevail in other great cities?"

"Yes, in cities great and small, from Washington, D. C., all the way to our newest summer resorts. It has become an ambition as well as a pastime with people of most liberal

culture, and, whether traveling or at home, is capable of affording them the rarest æsthetic delights. The exhibition here includes some charming amateur specimens from other quarters. Burnham's, of the Lick Observatory, we might almost claim as our own—anyhow, it is chiefly scientific—but there is the beautiful selection by George A. Nelson, of Lowell, Mass.—you were admiring his conception of 'The Village Blacksmith'—and that by Miss C. E. Sears, of Boston, whose sheep studies are so suggestive of Rosa Bonheur. James F. Barker, of Milwaukee, has also sent some fine landscapes, and everybody has noticed with pleasure the home-like suggestiveness of 'Coming from the Bath' and 'On Papa's Back,' by John L. Stettinius, who is a Cincinnati millionaire. Other fine exhibits from outsiders are those of Mr. G. E. Davis, of Dubuque, Iowa; O. L. Hesse, of New York; W. H. Walmsley, the Philadelphia dealer; and, in transparencies, of Messrs. Clarence B. Moore, of Philadelphia, and Daniel Miller, of Baltimore—this last phase of photography, by the way, being admirably adapted for interior decoration. Those of the foreign professionals, as might be expected, comprise some very superior work, notably the pictures of S. L. Stein, of Milwaukee; of H. B. Chamberlin, of Schullsburg, Wis.; of Theodore Endrem, of Cleveland, Ohio, and Arcourt, of Aurora, in our own State. The exhibits from British professionals—F. M. Sutcliffe, of Whitby; W. W. Winter, of Derby, and E. P. Gibson, of Hexham—are almost necessarily among the finest specimens of the art, while Scotland and Scottish life are duly honored by the groups bearing the label of Mr. and Mrs. Auchhorn, of Arbroath. The dealers and inventors—Carbutt, of Philadelphia, and M. A. Seed & Co., of St. Louis—are fittingly represented, the last named firm being the only exhibitor from the city at the end of the bridge."

"How do our local professionals figure beside those from abroad?"

"I hate to say anything about local professionals, for if you were to publish it some fellow would surely be jealous. At the same time, I cannot but avow that among the street, park and architectural views of J. W. Taylor, of Monroe street, I seem to find as good chemical effects as in any photographs I have ever inspected. His instantaneous views of racing and bicycling, and of the moving scenes of city life, are wonderfully clear and perfect. O. P. Scott has likewise made a fine general display, including some portraits of

local celebrities, which are of the highest merit. F. A. Place, though but recently settled among us, has made a handsome exhibit. The large-size pictures of D. R. Clark are likewise so many victories in that trying field of photography. Jacob Maul has largely confined himself to types from our German element, wherewith he proves himself to be thoroughly at home. E. L. Fowler, W. A. Cooper, and a few others, including Hurlbut, of Belvidere, and Gale, of Joliet, have also made displays quite worthy of their reputations. I notice that W. A. Howe, who was lately a real estate clerk, has developed into a professional, and supplies a good evidence of his progress in a line of excellent portraits. This transformation of the amateur into the successful trade photographer is by no means rare, and has given to the profession some of its most successful members. In fact, there is nothing to complain of in the professional part of the exhibition except that it is so limited—that so many who might shine in it have ignored it from conceit or apathy; though a few, no doubt, from unavoidable causes.”

“You consider the exhibition as a whole, then, to be fairly representative of the present condition of the arts?”

“From a cursory review I should judge that scarcely anything is wanting, except, it may be, that class of scientific photographs which have no interest save for students in laboratory or dissecting-room. Celestial photography is represented not only by the solar pictures of Burnham, but in learned studies of the spectrums by George Ellery Hale, of this city, and glimpses of the play of lightning and storms, clouds and sunlight by observers at different points. Of mechanics, there is a representation in the carriage pictures of the Studebaker Brothers, and in others, like the fine view of a Chicago and Northwestern locomotive, by Fred H. Davis, of this city. And then, in all the regions of life and art, from a simple portrait of a baby to a widespread landscape, from a solemn church interior to a crowded city street, there are such specimens as must give pleasure to all lovers of the beautiful. It is no hyperbole to say that of all ways known to man, such a display as is here contained alone ‘holds the mirror up to nature.’”

“And, moreover,” pursued “Doc,” “as limited as this first exhibition is, we find in it examples of all the latest discoveries in the art. The flash magnesium light, which is to render photography practicable even at night-time, is presented in its best effects by Mr.

Chamberlain and other exhibitors. The use of magnesium in this connection is not new, but the preparation of the metal in a powdered form insures a degree of activity which is more dazzling even than electricity. In engineering processes this is destined to be a boon, one of the pictures on view having been taken in a mine tunnel far beneath the surface of the earth. The carbograph, or photography on a marble surface, will never become very common, but specimens of it are shown which display quite effectively the beauties of which it is capable. So is it with all the other improvements in photography—all are illustrated here, as well as the comparative merits of the various kinds of lens, developer, plate and print, these appearing on the catalogue opposite each numbered exhibit, for the guidance of the inquirer into chemical effects.”

“You think, then, that the exhibition and its prizes will have the effect of stimulating the art of photography in Chicago?”

“The exhibition certainly should, as being the initial one of a programme long contemplated, and which is designed to bring together for mutual study and comparison and in friendly competition all lovers of this art in the West. It may still be a question, however, whether the giving of prizes at all is calculated to do good, as there is yet no standard of excellence which can satisfy at once the true artist photographer and his rival who is simply a craftsman.”

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

DISCUSSION ON NEGATIVE FILMS.

The *President*—In regard to the matter of films, I will allude to the fact that there was some difficulty found in connection with them. This letter has been received from Allen & Rowell, of Boston, the manufacturers of the ivory film, in reply to a letter from Mr. Beach. They say as follows:

BOSTON, April 6, 1886.

DEAR SIR,—Your favor of the 3d at hand and contents noted. In answer we can say that we are aware some spots have been found in our film, but we are at a loss to account for the cause. We have had packages sent back as worthless that, upon our testing them, proved faultless.

This has occurred in a number of instances. Your suggestion of camphor in the celluloid being the cause has had our consideration, and we cannot trace the spots to that. Cam-

phor has been used by us, in the wet process, in the collodion, with good results.

We appreciate your letter as being in the line of helping us to discover the cause of the spots.

Some of the spots have come from developing, we know; and some we know to be in the celluloid, but those are not more or worse than usually occur in glass plates. We have spent considerable time and taken the greatest of pains in making the films, and have thought we had a first-rate thing, but it is a new thing and has not had the test of time. If the celluloid is going to develop something that will make it useless for this purpose we have yet to learn it. We do not think it will. Some have had excellent success with it. We think as those who use it become better acquainted with it they will have less trouble.

We thank you very much for the kindly spirit of your letter, and can assure you that if there is any out in the films we shall do our best to discover it, and not let up till we have produced a perfect article.

Respectfully,

ALLEN & ROWELL.

The President—I think there are some of the gentlemen here who have had experience with that. If they would be kind enough to let us hear from them probably we could have a valuable discussion on this point.

Dr. NAGLE—Mr. Chairman, I have a few films which were made by Allen & Rowell, and some of you may be able to explain those spots which were found upon them. I had an idea that they were not roughened enough, so that the gelatine didn't catch on the plates very well, and I will pass them around so that the members might be able to give a better explanation of that than I can.

The transparent spots are in the form which you will see as I pass them around. I want to show that it is not the fault of development.

The President—What proportion of films in your use of them proved to be good and what proportion proved to be bad?

Dr. NAGLE—Well, I think that about 25 per cent. were spotted just in that way.

The President—You had no difficulty with the development of them?

Dr. NAGLE—Well, of course they are not as rapid as the Cramer 40's. They were a little slower.

The President—Have any of the other members had any experience with these films?

Mr. A. L. SIMPSON—I have tried a few of them, and found them without spots, but slightly prone to fog.

Mr. BIRDSALL—Percentages are rather misleading. I have found 100 per cent. of them spotted, but I have only tried three. (Laughter.)

Mr. DUFFIELD—Mr. President, do any of the gentlemen know if these spots are found in the Carbutt films?

Mr. CHAMPNEY—Here is Mr. Tiemann, who says that he found Mr. Carbutt's films good.

Mr. TIEMANN—I will only say that I have had about eight dozen of the Carbutt films, which I used down South; and all of those came out clear—that is, without spots. Of course some of them were under-exposed, others under-developed; but so far as spots were concerned, they were very free from them.

Mr. A. L. SIMPSON—I have also had the same experience.

Mr. DAYTON—Mr. Chairman, I have used dozens of Allen & Rowell's films, and they were very good generally; some of them were not—about a dozen of them had spots on them.

Mr. DUFFIELD—I understand, Mr. President, that the Seed Company has also placed films on the market—a negative film and a positive film. Have any of the members tried them?

The President—I have not had any experience with them, because I have never heard of them before.

Mr. A. L. SIMPSON—Isn't it possible that the spots are produced by air bubbles when the films are lying in the tray?

Dr. NAGLE—Fresh hydroquinone developer was used. You can see the spots in the unexposed films.

Mr. SIMPSON stated that they were caused probably by leaving the tray quiet.

Mr. NEWCOMER—Mr. President, I have had the same experience with bromide paper, which I found was due to wetting the film, and I finally submitted the matter to Dr. Ehrmann, and he developed some himself, but he didn't succeed any better than I did, and he sent them to the Eastman Company and they could not explain it.

The President—Had you any theory of it yourself, Mr. Newcomer?

Mr. NEWCOMER—I think the difficulty is unquestionably due to the water.

Mr. SCHRAM—I had similar experience—spots caused by wetting of the films—and that is the cause of my rising at this moment to speak. I exposed four films the other day, and when I developed the plate I first soaked

at for a few minutes in water. That film had quite a number of spots on it—probably a dozen—and the other three I developed without wetting them, no spots on them at all. I don't know whether the spots were caused by wetting or not, but that seems to harmonize with the statement that the gentleman has just made.

Miss COREY—I have had that same experience.

Mr. NEWCOMER—I might add that I found that the spots were certainly chemical in their character, because the direction of the rocking of the tray was also the direction of the spots when they started. I tried that; in fact, nearly all the experiments I could think of I tried, and Dr. Ehrmann could not explain it, and the Eastman Company have not attempted to, although importuned and expostulated with. (Laughter.)

The President—I would like to inquire if Dr. Nagle's experience tallies with that. Were you in the habit of wetting your plate?

Dr. NAGLE—No, sir; I don't know that I was. Some I wet and some I didn't.

Mr. SIMPSON stated that he believed it was due to the non-rocking of the developer.

Mr. TIEMANN—In the case of films, I always wet them before putting on the developer, but I also took the precaution to leave them there until any part of the film which might be a little less soluble than the other gets perfectly saturated, and I haven't had any spots at all.

(To be Continued.)

Bibliography.

DIE PHOTOGRAMMETRIE ODER BILDMESSKUNST. Von Dr. C. Koppe. Weimar: *Photographen Zeitung*, 1889.

This is a very complete manual of photography applied to surveying, by one of the professors of the Technical High School at Braunschweig. It is a large octavo volume of about eighty-five pages. It discusses plotting by means of photography and the value of photographic objectives for this purpose. A new instrument called a photo-theodolite, specially designed for this work, is described and its uses explained. In fact, it is a very perfect exposition of photo-surveying, and those of our readers interested in this subject will find the volume full of useful suggestions. It is well printed, and illustrated with a large number of wood-cuts, several plates of work executed, a sheet of licht-drucks by J. B. Obernether, and sheets of lithographic plates showing the construction of the instruments used.

UEBER AEHNLICHKEIT IN DER PORTRAIT-
PHOTOGRAPHIE. Von Hans Arnold.
Weimar: *Photographen Zeitung*, 1889.

This is a pamphlet of about sixty octavo pages which treats of the pictorial effect in portrait photography. Its usefulness is marred by the absence of table of contents and index, or, indeed, any guide to the matters discussed. It is well written and contains many valuable artistic ideas in portrait studies; but this long monograph of sixty pages is too hard to digest without an interval.

PHOTOGRAPHY FOR ALL. An Elementary text-book. By W. Jerome Harrison, F. G. S. New York: E. & H. T. Anthony & Co., 1889.

This small volume of one hundred and thirteen pages is written specially for the use of the beginner in photography. The subjects discussed embrace every operation in photographic manipulations, and the clearness of the style shows the touch of a master hand. From the photographic camera to the finished print Mr. Harrison gives all necessary details and many useful hints to the beginner. We cheerfully recommend it to all entering upon amateur photographic work.

TRAITÉ PRATIQUE DE PLATINOTYPIE SUR EMAIL sur porcelaine et sur verre. Par Geymet. Paris: Gauthier-Villars: Quai des Grands Augustins 55, 1889.

This is one of those neat little volumes of the "Bibliothèque Photographique," published by Gauthier-Villars of Paris. It gives all the practical operations for the use of the platinotype process on enamels, porcelain and glass. In the space of about one hundred small octavo pages the author discusses the formation of films containing metallic oxides, the various salts suited to enamels and ceramics. Also various vitrifiable films and collodions, methods of reproduction, preparation of the various metallic double salts, such as those of gold, platinum, iridium and others. The last chapter contains a number of valuable formulas.

HELIOGRAPHIE VITRIFIABLE. Par Geymet. Paris: Gauthier-Villars as above.

This is a little treatise of about one hundred pages upon the preparation of enamels for photographic purposes. It gives a list of the apparatus needed by the enameler, speaks of the selection of enamels, the size of the grain, the metal plates forming the basis of enamel work, the correct temperature for firing, retouching and other necessary manipulations.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—A. W. W. incloses cutting from an old copy of Walz's *Friend*, where an author advocates the use of concave lenses in the tube of a Dallmeyer lens, in order to increase the size of image. He writes: I came across an article which I inclose to you, asking if such a thing is practicable? If so, must it be with a wide angle lens? I have tried it with a No. 4 Euroscope and Rectilinear view lens, but can get no image in either case. You will notice there is a slight difference in the two articles inclosed. The last one says, "substituting concave lenses for the back combination." This makes altogether a different combination of it. An explanation through the columns of the BULLETIN will greatly oblige.

A.—Any concave lens has the power of diverging the rays of a convex lens, consequently if placed between two convex lenses, as in a double combination, it will make the image larger. No real image can be formed by placing a concave lens outside the focus of a convex lens, hence the second lens is necessary to form the image. In the case of the wide angle lenses, these are generally sufficiently short in focus to admit the use of concave lenses of the proper focus between the two combinations; but we think that the ordinary rectilinear lenses are usually too long focus to admit of this arrangement. It would be necessary to use a longer tube, admitting the separation of the two regular combinations to a greater distance apart. It must be remembered that the insertion of another lens between the regular combinations absorbs light and decreases the rapidity of the lens accordingly; furthermore the lens inserted must be accurately ground or it will give a distorted image even with the other lenses of the combination in first-class condition.

Q.—"Canada" writes: You will oblige me by answering the following through the columns of the BULLETIN. Should albumenized paper be cut to lengthen or widen the face in portraiture? Which way is generally used in large printing establishments?

A.—On looking into the matter, we find no rule followed generally; the paper is usually cut for economy without regard to stretching. Mr. F. G. Pearsall, of 298 Fulton street, Brooklyn, N. Y., has studied this matter and has had a patent for some special manipulation; he may help you if you write to him.

Q.—M. B. P. writes: Will you please inform me through your columns the best means of making "bichromate of copper and ammonium," and also its properties. I wish to use it in an experiment in photography. I have the chemical laboratory at my service to make it in. I have the chromate, but want the bichromate. By so doing you will greatly oblige.

A.—Try digesting bichromate of barium with a calculated quantity of ammonio-copper sulphate. We do not know the properties of this compound. It is not in any of the books at our disposal.

Q.—R. K. writes: Would you please instruct me through the columns of the BULLETIN if there is any way to make blue-prints shine to look as if they were burnished? Can they be varnished—if so, in what way? If you would kindly answer the above questions, you would oblige a subscriber.

A.—Flow the prints with a thin warm solution of gelatine, squeeze upon a piece of highly polished rubber, or a glass plate smeared with vaseline, and then rubbed perfectly clean. When dry, they may be stripped from the plate with a fine glazed surface.

Q.—A. W. R. writes: A short time ago I made up a silver bath after the formula published in your BULLETIN, called the O'Neil formula. I am getting very good results with the same, but there is one thing I would like to know. I am keeping my solution in a glass-stoppered bottle and give it a good deal of sunning, and there is a thick coating forming on the sides of the bottle, quite black. I used distilled water in making the same, and would ask it as a favor if you will inform me as to the cause of the same and if there is a remedy.

A.—The black color is metallic silver caused by the decomposition of the silver nitrate from the organic matter in the bath under the influence of sunlight. You can get rid of it, *i. e.*, dissolve it out of the bottle, by means of nitric acid. You cannot prevent its formation in the bottle.

Q.—F. D. S. writes: I have no trouble with my silver bath, but would like to ask a question or two in regard to the answer to A. C.'s question in the BULLETIN of May 11, 1889.

Now, that answer says that a pure silver nitrate bath should be acid with nitric acid. My book on silver printing by H. P. Robinson and Captain Abney says that a silver bath should be alkaline with ammonia. Now, which is best, or does either work well? And you said, too, that the bath should be just acid enough to blue litmus paper.

A.—A slightly alkaline bath is often used and works well; but with fumed paper an acid is generally used. We prefer the latter bath, the acid being just sufficient to turn blue litmus paper red.

Q.—W. E. S. writes: I inclose four prints, two developed with pyro and two with hydroquinone. Nos. 1 and 2 are pyro. The objection to 3 and 4 is the snowiness of effect, and I desire to know through the BULLETIN if there is any way of obviating it. In No. 3 the field and house in middle distance are nearly blank white, while in the negative there are fine details all through that part, and can only get them now by covering brook in foreground, that it may not become too dark. For studio work the hydroquinone is fine, giving detail through both lights and shadows. Hope you will be able to help me out of the difficulty with views.

A.—We think the trouble with the hydroquinone views is due to having too much alkali in the developer; use less of this latter component and go slow. There is too much contrast in the prints and they look hard from lack of half tones. Use weaker developer with hydroquinone than for pyrogallol and you will get softer results under all circumstances.

Views Caught with the Drop Shutter.

MORRIS EARLE & Co. write us that we were mistaken about the change in their business. The firm of W. H. Walmsley & Company no longer exists; they are conducting the business at 1016 Chestnut street, Philadelphia, and are the agents for Beck's Lenses.

MR. W. H. WALMSLEY is now doing business at 1022 Walnut street, Philadelphia, under the firm name of W. H. Walmsley, Limited, where he has an entirely new stock of photographic and optical apparatus.

MR. W. M. BUTLER, the Secretary of the St. Louis Camera Club, gave us a call the other day *en route* for Europe, whither he is traveling with a friend, intending to visit all the principal cities. As he carries his "Detective" with him, we hope to see some good pictures on his return. We wish the two gentlemen *bon voyage* and safe return.

WE have before us some excellent examples of Wolfe's half-tone photo-mechanical and fine-line process. They are certainly good pieces of work, and reflect honor upon Mr. M. Wolfe, of Dayton, O. When used for fine book illustrations upon coated paper they leave nothing to be desired in this class of work.

PHILLIPI BROTHERS, of 815 Arch street, Philadelphia, recently had a fire in their studio which caused considerable damage. We believe they were fully insured.

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A STUDY OF THE HAND

BY

Dana

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

JULY 13, 1889.

Vol. XX.—No. 13.

COMBINATION PRINTING.

FROM time to time we have questions sent to us by our correspondents asking for some method of making a combination print from two or more negatives. As the matter is of some importance, and as the most pleasing artistic effects can oftentimes be produced by such combination printing, it may not be out of place to describe briefly the methods followed and the mistakes that are to be avoided. This class of printing is alike useful to both professional and amateur photographers. A landscape may be taken in which some part of the picture is not agreeable or will not print correctly from lack of ability to focus or otherwise. A fine view of a river, with hills beyond, might be marred from the fact that in obtaining a good focus of the distance the foreground is indistinct, and the printing of it produces nothing but a blurred appearance. Under such circumstances, if two negatives are taken, one of the distance and another of the foreground, they can be combined in printing and a harmonious picture will be obtained. Again, a pretty landscape may be utilized as a background for a figure portrait or for a group; and some of the most artistic and attractive pictures we have seen have been made by just such combinations.

The beautiful effects of printing into landscapes clouds from negatives specially taken for the purpose, must have been noted by every one interested in the artistic side of photography. Indeed, a landscape picture without cloud effects is lacking in just that feature that makes such views most attractive to the eye, and these effects cannot often be obtained at the same time that a good negative of the landscape is secured. In such cases double or combination printing is one of the most desirable resources of the photographer. By using a yellow glass screen in front of the lenses the superior actinic effect of the sky can be modified, and clouds that would give over-exposure under ordinary circumstances can often be obtained on landscape negatives; but as a general rule, landscape negatives taken without special precautions give perfectly white skies in the printing. Furthermore, it often happens that when the clouds are particularly beautiful, the light effects of the rest of the landscape are unattractive and commonplace. It is therefore almost always best to print clouds into a landscape from specially prepared negatives. But one very important circumstance

must be considered in all cases of combination printing; the lighting of the objects in both negatives must be from the same direction. If this is not carefully considered, the most inharmonious and startling effects will be produced in the prints from the combined negatives.

The method of making these combination prints varies a little according to the particular combination to be made. When clouds are to be printed into a landscape the negative of which is cloudless, the first thing to consider is the direction of the light in each negative in the combination. A print of the landscape is now made upon albumen paper and then carefully cut at the sky line of the print. That portion of the print which covers the landscape section of the negative is now fixed to the cloud negative, the albumen side to the film, and when exactly in position is fastened with mucilage in two places at the lower corners. The portion of the cloud negative left uncovered should be suited to the character of the landscape, and also arranged to produce an artistic effect. In cutting the landscape print to form the mask, care should be taken not to cut into the sky portion. If a little of the landscape part is cut away, when used as a mask, it will allow the cloud negative to overlap the landscape portion in the printing, and this is not easily noticed; but if the landscape section overlaps the sky line the defect is readily noticeable. Having arranged the cloud negative with its mask, make a print, in the ordinary way, from the landscape negative, which gives a white sky in printing. When the necessary details are out in the landscape remove the print from the negative and place it under the cloud negative, very carefully adjusting the sky line to overlap (just a trifle) the landscape. In printing, shade the horizon a little in order to produce a lighter impression at that point in the print, for it will be noted that this portion of the sky usually appears slightly less dark than the rest.

The principle above described (masking out) can also be applied to the arranging of a figure, or even a group of figures, in a landscape. Taking the case of a single figure, a print is made from the negative containing it and the figure is carefully cut out with a sharp penknife, in such a way that both the figure and the surrounding part of the print are carefully preserved and will fit each other. In this way two masks are obtained—the figure, to use with the landscape into which it is to be printed; and the surroundings, to be used to cut out all but the figure in the negative from which it is printed. The figure (with its masked surroundings) is printed first, and then the landscape negative (with its figure mask) is adjusted to make the composition. Great care is necessary to make the masks register neatly, and if there are any defects in this regard they can usually be remedied by retouching the prints with India ink. By a series of steps similar to the ones we have indicated, three, four or even six negatives can be used to make combination prints. But to quote Mr. H. P. Robinson, in "Silver Printing," "a photograph produced by combination printing must be deeply studied in every particular, so that no departure from the truth of nature shall be discovered by the closest scrutiny."

A DESULTORY reading impresses one with the value of the matter the "International Annual" contains. I cannot conceive of any photographer, whether of little or much experience, failing to get fifty times the value of the book by reading it.

GUSTINE L. HURD, *Providence.*

EDITORIAL NOTES.

THE English Photographic Convention meets in London this year on August 19th. Lord Rayleigh, Dr. William Huggins, Professor Dewar and others are among the distinguished patrons of the Convention, which will be held in St. James' Hall, Piccadilly. We are glad to note that one of the features of the exhibition will be a historical collection of apparatus by manufacturers. We think the authorities at Boston might make a similar arrangement for the Convention of the Photographers' Association of America.

PARAPHENYL-DIAMINE, a new organic body recently patented in Germany as a photographic developer, has been tested by Herr Stoll, and he finds that it does not give the good results that the patentee claims for it. The use of caustic alkalies improved its working, but showed a ready tendency to fog the negative.

IN a very able paper upon "Shutters," read before the Camera Club Conference in London, Mr. T. R. Dallmeyer comes to the conclusion "that the best possible position for equality of illumination is at the optical center of the combination, and the aperture should be of circular form, or as nearly as possible so." A shutter based upon these principles has been constructed by Mr. Dallmeyer.

ZEISS, the well known German optician, has recently put upon the market a special stand for photo-micrographic work. It is capable of the most varied combinations of both microscope and camera, and appears to be admirably suited to the needs of those making photo-micrography a study. A very good figure of the apparatus, with a brief description of the parts, appeared in the June number of the *American Monthly Microscopical Journal*, to which we refer those of our readers who are interested in this branch of photography.

WE have before us the first number of *Bollettino Dell' Associazione Degli Amatori di Fotografia in Roma*, which contains a list of the members of the society, an article on carbon printing, with book notices and short photographic items. We wish the new journal every success.

FROM Dr. George L. Sinclair, of Halifax, Nova Scotia, we have received several excellent views. "Fishing Schooners leaving for the Banks" is good, but there seems to be a slightly weak spot in the negative, which gives a dark shadow in the print. "Fairy Cove" is a gem, full of detail in the foliage, soft and well toned, making an artistic picture. "The Old Mill Dam" and "Part of Pond, Public Garden," are both well done, good, clean photographic work, but the pond picture would be improved if printed darker.

THE amateur photographers of Troy, N. Y., have organized a club, with Dr. J. E. Fairlee as *Chairman* pro tem., James Muir, *Secretary*, and Arthur Smith, *Treasurer*.

MRS. CATHERINE BRUCE, of New York, has recently given \$50,000 to Harvard Observatory, to be applied to the construction of a photographic

telescope having an aperture of twenty-four inches and a focus of eleven feet. It will have two achromatic lenses, and will cover an area of the heavens more than six times that of a telescopic objective.

MR. J. A. PALMER, of Aiken, South Carolina, sends us two more daguerreotypes taken early in the fifties. They are two portraits, and are remarkably well preserved.

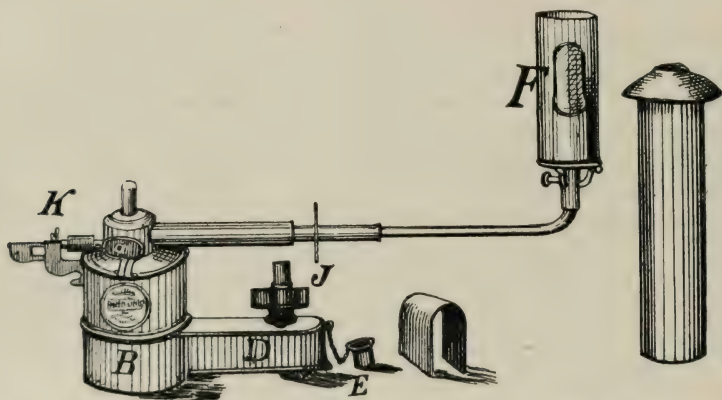
BREEZE LAWN HOTEL, at Hunter, in the Catskills, has a dark-room with running water for the use of photographers who are guests of the house. S. H. Scripture is the proprietor.

THE Mystic Camera Club, of Medford, Mass., was organized June 4th, with G. L. Stone, *President*; G. E. Davenport, *Vice-President*; J. F. Johnson, *Secretary and Treasurer*. The Club meets the first Tuesday in each month; annual meeting, first Tuesday in January.

FABRICIUS LAMP.

BY DR. H. W. VOGEL.

THE following description and cut will explain the arrangement and its application :



If the ligroine incandescent lamp is to be taken into use, the alphabetical designation with regard to the following explanations should be taken into consideration.

Part *A* is unscrewed from the ligroine-holder *B*, and the latter is filled to three-quarters (therefore not quite full) with pure ligroine (also called benzine). Part *A* is then screwed on again and so tight (if necessary by means of a screw wrench) that no gas can escape from the holder *B*.

The wick-screw *C* with the wick is then released from the reservoir *D* and this is likewise filled to three-quarters (not quite filled therefore) with alcohol, whereupon the wick-screw *C* is turned back to its regular place again. The cap *E* is now lifted from the wick; if in the meantime the wick has not been sufficiently impregnated with the alcohol, a few minutes should be given until this has been attained, or it should be moistened with the alcohol. The wick is then ignited, whereupon the gas producer will develop the gas.

If the wick has been lit, the valve for the escaping gas should be opened at once. This is done by turning the regulating disk *K* (as with an oil-lamp) from left to right until resistance takes place.

After this about a minute should be waited, until a weak noise is heard in the atmospheric burner *F* (upon which an Auer incandescent mantle has been placed). The escaping gas must then be lit at once and it will burn continually. The lighting is done with a match, or better, with an alcohol burner, so as not to injure the fine incandescent body (net) which is extremely tender and must absolutely not be touched. By a conformable regulation by means of the disk *K* it is easy to determine the required degree of escaping gas to produce a purely white, very actinic light.

The regulation of the alcohol flame is done by taking the alcohol flame regulating slide *J*, at one of its two wings, and pushing it up and down several times, but very slow. The more it is pushed upwards, so much smaller the alcohol flame will appear; the more it is pushed downwards, so much larger the flame will burn.

If the gas producer is to furnish much gas, the alcohol flame should be left burning pretty large; but if the quantity of gas is to be reduced, the flame must be made smaller.

Important finally is the regulation of the gas flame, and to become acquainted with the complete shutting off of the same. The regulating disk *K* should be taken in hand and turned several times from right to left and back again, whereby it will be perceived that the more it is turned from left to right, so much larger the gas flame will appear; and the more the same is turned from right to left, the gas flame will become smaller, and extinguished finally, because the escaping valve will at last be entirely closed.

The alcohol flame should then be blown out at once and the wick-cap *E* should be set over the wick.

In using the apparatus the following should also be observed :

First.—Into the ligroine reservoir *B* nothing else should be poured but pure ligroine ; further, the receiving screw *A* should always be very tight.

Second.—As soon as the alcohol flame is burning, the regulating disk *K* should be simultaneously and completely turned open to let the gas escape through the opened valve and not through the safety valve.

FREE NITRATE OF SILVER IN THE CYANIN GELATINE PLATE.

By V. SCHUMANN, *Leipzig*.

THE color sensitiveness of a gelatine plate colored with cyanin depends to a high degree on the manner of sensitizing. Years ago I have already shown that the coloration of the liquid emulsion sensitizes almost for red only, whereas a cyanin bath furnishes not only red, but also yellow sensitive plates. Later tests taught me that the cyanin plate colored in the liquid emulsion obtains also high sensitiveness for spectrum yellow, as soon as the same is bathed in aqueous ammonia. Such plate, with sufficient ammonia (4 to 6 per cent.) in the bath, exposed, wet or dry, may prove even more sensitive for yellow than for red. Such a bath increases also the total sensitiveness and intensity of the plate in a surprising way. Quite lately I have observed that free nitrate of silver is also able to increase the yellow action of the cyanin. If I mix gelatine emulsion,

after the washing is finished, with a solution of cyanin in alcohol and add a few drops of nitrate of silver, I obtain plates which show higher maxima in yellow and red than cyanin alone. The nitrate of silver increased the yellow sensitiveness considerably and also the intensity of the plate. A plate bathed for one or two minutes in aqueous ammonia (4 per cent. N H_3), its total sensitiveness would experience another increase, particularly in the yellow. The purity of the plate film after bathing was unfortunately not as good as would have been desired. It tended to cloud formation and fog. Less ammonia gave purer plates, but not such high color sensitiveness. Notwithstanding the last mentioned increase of sensitiveness, the plate remained for yellow far behind the red.

All my tests prove now clearly that free nitrate of silver has an essential influence upon the color sensitiveness of the cyanin plate, but that the advantage of the increased yellow-sensitiveness is too small to be of any value in practical photography. It is, therefore, not my intention to recommend free nitrate of silver besides cyanin for the gelatine plate, particularly as the plate colored in the emulsion with subsequent ammonia bath will give better results. The conditions of cyanin differ essentially from those of eosin and its derivatives. Eosin combines easily with silver; cyanin, on the contrary, does not. Although eosin silver plates do not contain eosin silver, but to all appearance only the decomposition products of the same, still free nitrate of silver will act upon eosin in galatine emulsions more favorably than upon cyanin.

My results offer, from all that I can see, only scientific interest. They prove distinctly, as already pointed out in another place, how much the action of optical sensitizers may depend upon other circumstances. According to the kind of sensitizing, one and the same coloring matter may produce quite different effects. This seems to be particularly the case with cyanin. At least I have observed with no other coloring matter such a spectro-chemical difference as with the latter.

LEIPZIG, May, 1889.

DEVELOPING BROMIDE OF SILVER PAPER.

BY F. STOLZE.

(Continued.)

BEFORE large sheets of bromide paper are exposed, proof should be had of its sensitiveness by testing a small piece of the paper. I use one negative for this purpose of medium printing time, which serves as a normal negative for direct prints and for developed enlargements. Bromide of silver paper I expose behind this negative at a distance of 2m. and an ordinary flat flame burner, and I expose in divisions, by moving a small board, $2\frac{1}{2}$, 5, $7\frac{1}{2}$, 10, $12\frac{1}{2}$ and 15 seconds. I develop in 5 parts of a saturated solution of oxalate of potassium and 1 part saturated iron solution without potassium bromide.

From the result I can see which exposure is the best, and whether potassium bromide has to be added or not. If, now, the best time of exposure was known for former preparations, the proportion for corresponding enlargements will follow therefrom. This test with a negative is better than that with the photometer, being not only conclusive for the half tones, but also for the whole picture. Attention may be here called once more expressly to the fact, that the potassium bromide addition, also unnecessary for negatives of normal density, cannot be spared for thin negatives, and that it has to be withheld for hard

negatives as much as possible, if exposure and development are not to be prolonged unnecessarily.

For slowly developing paper it is urgently advisable, if an addition of bromide of potassium is required, to prolong also the exposure, which sometimes may even be doubled. A quick and still brilliant development is hereby obtained.

Although certain kinds of bromide of silver paper of high sensitiveness, as mentioned before, will give no strong pictures generally, it is not a necessary conclusion that bromide of silver paper cannot be highly sensitive and work brilliantly at the same time. These properties depend upon the method of preparing the emulsion. Thus I succeeded, for instance, in producing emulsions which work brilliantly with a little bromide of potassium, and have from twelve to twenty times the sensitiveness of the Eastman paper. They are even sensitive enough for the most rapid instantaneous pictures. If, nevertheless, I advise against the regular production of such sensitive preparations and myself have abstained again from their use, it is done because experience has taught me that they are generally over-exposed by professionals who have no faith in such a sensitiveness. To be sure, one is capable of making enlargements on such paper with gas or kerosene light in a moderate time; but as most of these have preparations for the magnesium flash-light, they would be obliged to work with very small diaphragms, to which they are not used. I have returned again, therefore, to a moderate sensitiveness, as in the beginning, which has the advantage of easier and simpler production. It is beyond doubt that emulsions of higher sensitiveness will render the same strength with more difficulty than less sensitive ones.

To return now to the development and further treatment, it happens sometimes that an emulsion film fixes with difficulty, and this not only with differently prepared emulsions, but also with such prepared by the same formula, for reasons not explained yet. This peculiarity goes mostly hand in hand with a reduction of oxalate of iron in the film, which takes place in the first wash. As explained previously, the best means against the yellow coloration produced hereby is an increase of acidity to double and three times its proportion in the first water and long fixing. In particularly obstinate cases the acetic acid may also be replaced by muriatic acid. A softening of the gelatine is not to be apprehended, as this fixing difficulty occurs generally only with very hard films. One should not always come to the conclusion of its being a faulty preparation if the paper shows this property, as the application of the means we advise will lead to a successful result.

Besides the means mentioned by me recently for the improvement of the tone—it was a prolonged resting in the fixing bath, the alum bath, or any combined tone fixing bath—there are several others. Gold baths, which also help, are generally too expensive. A much diluted bath of chloride of copper will act very rapidly. To produce the same, a concentrated solution of this salt is made, or one part of a saturated chloride of sodium solution is added to one part of saturated sulphate of copper solution; and drops of this liquid are added carefully to water, until this will quickly tone a bromide of silver bath. The picture is then quickly taken from the dish and washed, to prevent bleaching. But in the beginning it will not weaken the shadows, but strengthen them. Captain Himly has confided to me still another similar means, which is still more

handy to all and which I have also found to be of good effect. It consists in a very diluted bi-chloride of mercury bath, with adequate subsequent treatment. Leon Vidal's process might also be recommended, whereby the silver picture is changed into a platinum one.

Regarding the oxalate developer already used, I would still remark that I restore the same always after Lagrange's method, and I keep in well sealed bottles. Working very little with bromide of potassium and taking usual developer each time, reproduced developer will work but little harder. The development of the large pictures is very cheap, and this process can be highly recommended.

SPEED INDICATORS FOR SHUTTERS.

BY MR. G. LINDSAY JOHNSON, M.A., M.B.

[Read before Camera Club Conference.]

THE instruments which are best suited for testing the rate of shutters fall under two heads,—those which depend for their motion on gravity, and those which are moved by mechanical means. Under the first head we have for our standard of time a pendulum. 2. A weight dropped from a known height in front of the camera. 3. The rate of a ball or cylinder rolling down a smooth board at a known angle; and lastly, in the case of the well known drop-shutter, the distance through which the drop falls in front of the lens. This latter is very convenient, as the rapidities can be marked on the drop itself according to the height through which it falls. For those who may have one of these shutters I append a table containing the fractions of a second which the drop takes to

Diameter of lens aperture in centimeters.		2 cm.	4 cm.	6 cm.	8 cm.	10 cm.	15 cm.	20 cm.	25 cm.	30 cm.
	4 cm.	$\frac{1}{16}$	$\frac{1}{22}$	$\frac{1}{27}$	$\frac{1}{13}$	$\frac{1}{35}$	$\frac{1}{43}$	$\frac{1}{50}$	$\frac{1}{55}$	$\frac{1}{61}$
	5 cm.	$\frac{1}{13}$	$\frac{1}{18}$	$\frac{1}{22}$	$\frac{1}{25}$	$\frac{1}{28}$	$\frac{1}{34}$	$\frac{1}{40}$	$\frac{1}{44}$	$\frac{1}{49}$
	6 cm.	$\frac{1}{10}$	$\frac{1}{15}$	$\frac{1}{18}$	$\frac{1}{21}$	$\frac{1}{23}$	$\frac{1}{29}$	$\frac{1}{33}$	$\frac{1}{37}$	$\frac{1}{40}$
	7 cm.	$\frac{1}{9}$	$\frac{1}{13}$	$\frac{1}{16}$	$\frac{1}{18}$	$\frac{1}{20}$	$\frac{1}{25}$	$\frac{1}{28}$	$\frac{1}{32}$	$\frac{1}{35}$
	8 cm.	$\frac{1}{8}$	$\frac{1}{11}$	$\frac{1}{14}$	$\frac{1}{16}$	$\frac{1}{18}$	$\frac{1}{21}$	$\frac{1}{25}$	$\frac{1}{28}$	$\frac{1}{30}$

fall across lenses of various diameters. The top line represents the distance in centimeters through which the drop falls before the lens begins to be uncovered.

The other forms above mentioned all possess such great drawbacks, in my opinion, that they may be dismissed at once as unpractical for our purpose. Under the head of Mechanical Time Indicators we have two distinct classes,—those which are used for direct light, and those in which reflected light is employed to register on the sensitive surface. Among the former we have Addenbrooke's apparatus, which he exhibited at the Photographic Society, and which consisted essentially of a dark slide containing a sensitive plate, and capable of being revolved by a crank worked by the hand. The slide, open in front, rotated in a narrow fixed box, perforated in front by several small holes placed in a line from the center. In front of this again was a lantern containing

a piece of magnesium ribbon, and having the shutter to be tested fastened in front. When ignited, the light, entering the holes above mentioned the moment the shutter was released, acted on the plate as it was rotated at a given rate, say once a second, forming when developed dark lines or arcs. The length of these lines had only to be compared with the circles of which they formed the arcs to indicate the fraction of a second taken by the shutter at that particular point.

The objections to this method are—1st, the difficulty of regulating the speed by the hand in a uniform manner; 2d, the necessity of working in a dark room; thirdly, the fact that the ratio between the arcs and their circles had to be increased each time.

The next method by which direct light is used may be described as a drum moved by clock-work. This drum carries on its surface a band of very sensitive film or tissue, and is protected from the light by a wooden box perforated by an aperture corresponding to the opening of the shutter. In front of this aperture is a tube fitted with an objective, in front of or within which the shutter works. A release acting on the clock-work sets the drum revolving, and the shutter, pointed to the sun or other bright illumination, is released, and records the impress of light on the revolving surface of the film when developed. I have made one of these machines after the pattern suggested in the journals, and should have exhibited it to-day but for some alterations I am making in it. This is by far the most scientific form of speed-measurer, as the abscissæ ruled off on the developed film represent the size of aperture at any given time, while the ordinates show the total duration of the exposure in terms of the circumference multiplied into the speed of its rotation.

But this, again, has many objections. If we wish to prevent fogging the film a lens is necessary to limit the action of the light, and then the difficulty of focusing the lens comes in, and of fitting the lens to the tube.

To avoid these difficulties I have contrived the following form of speed-indicator. I removed the escapement from a large kitchen clock, and in its place substituted a fanfly to regulate its velocity. By filing this down I got it to cause exactly one revolution of the dial screen per second. The dial, which is a white porcelain one, is divided circumferentially into sixty divisions, and each of these in a separate scale into ten smaller divisions, making 600 in all. Screening these from the light is a black metal screen, with a rectangular opening at one spot equal to ten of the smaller divisions in breadth. As this screen revolves once every second, if the shutter were opened for that time all the divisions would be recorded on the sensitive plate behind the shutter and lens; or, again, if the shutter were open for one-tenth of a second seven large divisions would be recorded, *i. e.*, six divisions uncovered, together with the one large division behind the aperture.

Besides this movable disc there is a short recording hand moving from the center, which makes one-twelfth of a revolution in a second, *i. e.*, one complete revolution in 12 seconds.

In order to find the exposure for all parts of the plate some other contrivance is necessary, seeing that all shutters start from nothing, and after arriving at their maximum opening, close up more or less quickly to zero. This result is obtained by placing immediately in front of the plate in the camera a screen containing six square apertures, each about one-fourth of the height of the plate.

Three of these apertures are arranged, one in the center of the plate and one above and below, and three at the side of the plate arranged in a similar manner. We have thus six squares. Five of these squares are always covered up by square cardboard screens, so that the light only passes through one at a time. The screen is made somewhat shorter than the opening of the camera, to allow the hand to be inserted to remove the small square screens more easily; for the slide comes too close against them to allow of handles being attached.

We now suspend the clock to one of six nails which are driven into the wall at such distances that the camera in its proper relative position will allow the clock to be seen, filling up one of the squares when viewed through the ground glass. Thus, each square is opened in turn, and as the weight is released and the clock shield revolves, a shutter exposure is made. When all six have been taken, the plate, previously inserted behind the screen, is developed in the usual way, and according to the number of divisions visible in each negative, the exposure for each part of the plate, etc., can be read off at once. Of course, it is necessary to have the clock facing a strong light, such as the sun or bright sky.

DISCUSSION.

CAPTAIN MANTELL asked Dr. Johnson whether he had insured the accuracy of the speed of the clock in any way, and pointed out how that could be very easily done by synchronizing it with an electric attachment.

MR. WOLLASTON gave his ideas on testing shutters. He totally refused to believe that it was possible to get even fairly accurate results with instruments of the dial type. He thought the only true way was to place the source of light inside the camera and pass it through the shutters and lens onto a revolving circular plate such as is sold with Stern's waistcoat camera. He would then place in the diaphragm slot a special stop, having a small hole on the outside edge, another nearer the center, and so on; in fact, a series of small holes along a diameter. A photograph taken would then give dark spots corresponding to each hole, and as the shutter successively opened and closed it would make its own record on the revolving plates, and the length of the marks would give the time the shutter was open at each part.

MR. A. J. WALL asked Mr. Dallmeyer why he did not use shutters working in front of the plate; he was now devising one that on a whole plate would work at $\frac{1}{40000}$ of a second.

MR. DALLMEYER, in reply, said that he had not treated of any other but diaphragmatic shutters, and had endeavored to improve the efficacy of these as much as possible.

THE LIMITS OF PHOTOGRAVURE.

BY A. DAWSON.

[Read before Camera Club Conference.]

HAVING been desired to prepare a paper on photo-gravure—*i. e.*, the production of intaglio plates in half tone (although line subjects and maps are equally photo-gravure)—I desire to respond to the best ability that other demands will permit.

I propose in this paper to keep to the artistic aspect of the question, and so doing rather to point out the limits of the science as I have so often encountered them. Others, I am aware, frequently take a sort of pride in the capabilities of the method; but when the demands of taste have to be met, it does not allow one much time to think of anything but how to enlarge our field of work, and how to increase our production without losing quality.

Remembering that well cut copper plates never gave the number of impressions that were desired by engravers, and that steel plates were introduced to

remedy this defect—then remembering that photo-gravure plates are far weaker and shallower than even copper engraved plates—it will be seen that there was much to be done, and there still is much to be done, to make it perfect.

I would suggest that the making of a fine photo-gravure in steel be kept in mind as the desideratum of the future.

Of course, we steel face all plates nowadays, however engraved, so only that they are made of copper. But any one who has had to work a plate hard knows the grief of wearing the precious film of iron (or, as it is called, steel) away. This protecting coat is the only thing that makes photo-gravure a possibility for book work. And the wearing of it away is the one great hindrance to the long endurance of the plates. Partly by reason of the action of solvents in removing it, partly by incipient wear when it gives way, the second coat of steel is found always a greater load for the plate to put up with than the first—lights are smoother and darks are more leveled down to one uniform shade. This power of endurance of the first coat of steel then becomes the real limit of the number of fine first-class prints obtainable. The art of making a really good and yet thin steel face carries a deal along with it. We generally reckon 500, but often 1,000 are printed off one facing before it gives way.

It is rather hard to have to start in this tone; but it is really necessary to remove the common impression that once a copper plate is manufactured, an infinite number of the finest impressions can be produced as a matter of course. It is a great mistake in the present condition of the art.

Let me now imagine a plate from Turner's "Liber Studiorum" before you, and I would say that, putting aside the enormous power of the bitten outlines, the mellow transparent tones are what we have to get. Remember that these plates are deeply cut into the copper by the mezzotint tool, which cuts sharper and deeper than holes made by chemical means. The result is that a transparent ink made with soft color, such as bitumen or Vandyke brown, may be used instead of black and burnt umber. The result is that the deep plate gives a much softer and more glowing print than we do with our shallow chemical grains.

I do not think I can by all my power convey to an ordinary onlooker an idea of the great width and depth of the gulf that once separated the struggling processist from the technically perfect engraver in steel or copper. I feel sure that if the processist knew the length of the journey before him he would scarcely have desired to start on it.

But, instead of this, we found the first photo-gravure or the first relief photo-block swaggered about and shown all over the place as a wonder and a thing to supersede the hand entirely. Now, although the automatic methods are at present very much to the fore, yet it is chiefly as rivals. Etching has made giant strides beyond all our early anticipations; scientific skill and cultured taste have placed wood-engraving quite on the platform of a fine art. The result is that, although processing is a truculent and ever-watchful rival, it is kept in a limited field; and whether in relief or intaglio, I am quite sure that human mind and skill, having brought one branch out of nothing, will bring the other out of past shortcomings to future excellence undreamed of now.

The same spirit of swagger followed the first good results of photography, and what do we find now?—simply that it is a serviceable assistant to art; but no artist building up the feeling of a composition bit by bit, line by line, tone by

tone, with centuries of work and the labor of great genius piled together on his mind, can ever get more than a suggestion from it. It is certain that the photograph is a useful help, but it is no substitute for art. So it is certain that photo-gravure is a useful means of producing prints—probably the best means devisable for making a high-class fac-simile; yet the artist is as needful as ever, and the man of science will wait upon the artist, and the artist will help the man of science.

Thus the earlier idea of superseding and abolishing an old art must be given up, and a new idea of co-operation to a single end take its place.

I go through these points at some length because they are the result of my own laborious and energetic efforts to produce art by processing. Year after year the attack has been renewed; but though processing has advanced, it has been apparent that the goal advanced also; and that, though I could do things easily that the hand could never do so truly, yet, that same hand guided by skill and taste did things that I could never catch up by my processing.

Perhaps the prettiest point in photo-gravure has been its power to render the texture of the surface of the picture or original. It is peculiar that in proportion as a copy without texture is employed, such as a silver print, so in proportion does it become difficult to make a plate that pleases the eye. If, however, instead of the silver print we use the negative from which it was printed, we get a much better result—chiefly in this case, I believe, because the print on paper is a defective original compared with the negative, its tones being less accurate, and its outlines being a little furred up by the fibers of the paper.

But if we make a plate from a rough wash drawing, it is quite pleasing to see the rough paper texture. Now take a silver print of this rough paper sketch, and it immediately looks poor in comparison. We now see that the photo-gravure is capable in things where the photograph is weak; but the photograph is strong in the brilliant, yet tender, reproduction of natural forms, portraits, etc., though its very smoothness and perfectness unfit it for many purposes of art reproduction.

This being so, it will be well to push each art along the line that it has shown a power over, and not to strain too much after things that it cannot do.

One of the beauties of photo-gravure is the power of giving steady atmospheric grays. I am not sure that in this great feature it cannot break a lance with every known mode of art reproduction. The extended grays of mezzotint are certainly not better than those of photo-gravure, but they are very generally worse. I can scarcely call to mind a mezzotint in which the quality of tender atmospheric gray is its one great point. Though I admit its charms of light, yet those lights are small and set up by contrast, whereas in photo-gravure we get mist whenever we like as well as light.

This quality enables the impressionist photographer not only to fix in printing ink the happy triumphs of the camera, but to consult with others, and add art to nature's work in the refining of one part, or the strengthening of another part, and thus it must be admitted that a new feature is added to art reproduction in these works. It may be the summer haze over the meadows, or the driving mists of a storm on the coast; they can be caught by the practiced impressionist in photography, and they can also be fixed on paper by photo-gravure in a more living, moving way than by any other mode.

This, then, is one special point in the art. Let it be cultivated and encouraged. Nothing pleases men more permanently than a sweetly rendered

aspect of nature, whatever kind of aspect it is—all are welcome in the form of pictures and prints.

There are two branches or classes of picture reproduction in which photo-gravure shows considerable power. The one is a figure picture, in which clear cut, well drawn forms are the chief elements, the smooth surfaces of flesh and drapery lending themselves to the same power that we noticed in the case of the impressionist landscape. The other is where powerful brush-work and flashing effects are got, in a manner that labor with a point or scraper can scarcely follow. In both these there is a field for photo-gravures from pictures.

But in practice I find that oil pictures are the most troublesome of subjects to work from. There is frequently a subtle irregularity in the execution or glazing, or the absence of glazing; the blue tinted colors, rough touches of the brush afterwards painted over, and many similar things, make it slow and difficult to produce a plate. Although, therefore, one picture may be, most happily and beautifully given in photo-gravure, it does not follow that another will, even though they both look alike in effect, color and execution. The camera is a great detective, and it often brings out things that cause much labor to set right. Another fault in a plate from a picture is the want of power to give a whole scale of tints below what it gives as a black. The artist's darkish gray generally comes black on the plate, and then we have to put in by hand several shades of darker tints. This is sometimes a risky and laborious affair.

There may be a dozen different textures and surfaces to render in various plates, and there are as many modes of putting in the color. For instance, we may use the roulette, which does not go as deep as one would wish; or a small rocker, which is better for depth. Then there is the multiple graver, or the common graver. Or a strong etching ground, and bite in a lot of etched work; or a re-bite on the old granulations. Thus, added to the trouble of doing the additional work, is the trouble of finding out the most suitable mode. When it is noticed what subtle things will make a method look wrong, it makes one nervous about putting the work in. Big rough points like the teeth of a rasp suit one place; single deep cuts with the graver suit another; and acid on a re-biting ground a third. But it requires years of practice to get the knowledge.

Therefore, photo-gravure should not be regarded as an independent and complete power in itself, but as a new method or means of production, having great beauties when well worked, but not able to meet every case that comes before us in the way of daily requirements.

Seeing that the nature of the original is of importance to know, it would perhaps be welcome to record the results which I have myself noted.

The best working originals are the most seldom obtained in the way of business—viz., oil painted monochrome, with a steady, solid impasto treatment. The solid, yet not too solid, effect just suits the process, because it yields a peculiarly agreeable negative.

Perhaps the worst copy usually met with is a water-color drawing in which much sponging has been used, and where blue is prominent, or neutral tint, with perhaps a warm-looking paper. The vigorous rough Indian ink sketch is not so intractable by any means, and this must be taken to be what I have already referred to.

A crayon drawing, if not too rough and gritty, also answers well. Some

of Holbein's come out very nicely, being most delicately penciled, and having vigorous portions to bring them out.

Portraits are fairly adapted for reproduction ; but it must be remembered that in them we are very captious judges—we want the minutest points in form and shade followed out, as well as a good flesh texture. Portraits from the life are not much better adapted than portraits from painting are. The chromatic changes of the one are only more treacherous than the texture changes in the other. Perhaps the most successful results are those from old mezzotint plates, which always give a level solid negative, containing a slight grain, which is copied from the original mezzotinting.

After these there comes a sort of mixture of difficulties from many sorts of originals ; perhaps the most disagreeable of all is a dear old illuminated missal or chronicle, with highly colored little pictures. The surface of the vellum is fluffy in parts, the colors are uncontrollable, and the work entailed is great. Photographs from nature, such as are commonly executed for sale in favorite localities, also interiors of houses, garden scenes, lead pencil sketches, sepia drawings, bric-a-brac, and many similar or different things, only present new phases of difficulty. No two can be dealt with quite alike, the reason being that the eye is very critical, and the camera rather treacherous in the negative it provides for us. I refer at length to these points rather to correct the impression that whatever you ask for in photo-gravure, it is sure to come out prettily.

The point I would specially press, then, is this: that all the methods of photo-gravure yet practiced, when worked at their very best advantage, produce similar results, and the same identical difficulties meet us by whichever mode a plate is produced. One mode does, indeed, differ from another in its power as well as in its method, but the subject in which one fails will most probably fail in another method, and the good subject for one method will be a good subject for another method.

The first efforts at physical photography were said to have been the production of photo-gravures by the process of printing in a film of bitumen; then, after clearing it, to bite the plate in the clear parts. This mode is still practiced on the Continent for line subjects, and it is a tolerable method where skill and patience with good originals and bright daylight combine, but it is practically valueless in England at the present time.

The best line method is that of G. Scamoni, of St. Petersburg, who imparted all its details to me ; and though I never gave the care and labor to it that he did, I am sure it is hard to surpass it for line-work. The method is to grow a copper-plate upon an autotype mold in line. The mold is developed on a surface covered with a fine layer of india rubber varnish, and it is made conductive by black lead. The support may be glass, copper, or other metal, not to mention xylonite, which does very well.

This method naturally led up to the desire to get half tones. Scamoni got toned plates from crayon drawings, but not from flat tints. The mode first of all worked was by bronzing a negative or the tissue of which the mold was to be made, and this caused a multitude of punctures in the mold which, when electrotyped, became points in the copper, thus causing the portions of the mold remaining to have various depths. This method now and again gave very fine results, but frequently it failed. Probably if worked more in the light of modern

experience it would be much better, as in those old days twelve years ago we were more anxious to get automatic conduction by means of silver and gold on the surface of the mold than it is now found necessary. It is worth while remarking that plumbago for conducting cannot be excelled, provided all proper means are taken to insure its fineness.

There were also at an early date plates called galvano-plastic. These I know not the method of. They were weak, and required a deal of line engraver's fine ruling, etc., to put them to rights; they are therefore now quite out of date and almost out of memory. But they lead one to refer to the process of Pretch, which was also practiced in England for a time, and which ought to have gone on better than it did. It is worth while mentioning this process as the chief instance of depositing copper on the whole mass of gelatine. There is no mold washed away. It is caused to swell and form an automatic grain, which regulates the tint, and it should be classed with two methods which I will next detail.

(*To be continued.*)

FUMING PAPER.

To the Editors of the BULLETIN:

If "The First Dry Plate Amateur" will refer to my papers of last year giving an account of an old photographic exchange club, he will find some mention of the fuming of albumen paper, as invented by the late Mr. H. T. Anthony. The dry plate amateurs of 1861 and 1862 even tried fuming their dry plates. The pages of the journals of 1862 are quite full of the arguments about the inventor of the fuming process. The only one who tried to claim priority over Mr. Anthony was a gentleman of Jersey City, who proposed making ammonia nitrate paper by fuming the plain paper. It was never shown that he fumed albumenized paper, or if he did that he was in advance of the use of it by Mr. Anthony as a trade secret given by him under the bond of secrecy to the members of the Exchange Club that was started by him.

"The *First Dry Plate Amateur*" should have known all about this argument; for when I began to photograph in 1857 or 1858, Mr. Cole, an *amateur* of Baltimore, had published his book on dry plate work. Such men as the late Mr. S. Fisher Corlies, Mr. J. C. Browne and others, of Philadelphia, who practiced the art from, say, 1860 to 1889, worked all the dry processes as they came out, and took to the manufactured plates as soon as they were on the market. They remember the long pen fight between "Siccus" and "Humidus," with the defeat of the latter.

Want of time prevents my writing at length on the subject of the fuming process as invented by Mr. Anthony.

If "The First Dry Plate Amateur" will send me his address, I can send him a copy of my paper on the old club in pamphlet form.

Very truly,

COLEMAN SELLERS.

YET ANOTHER VETERAN.

ON page 286, No. 9, "William Notman" goes "Mr. Rockwood" one better. I now put in my bid. In 1853 Mr. Anthony wrote me in regard to an order for a bath: "We have none and know of none having been imported, but we send you some sheet gutta-percha, and you can make one for yourself. As

regards gun-cotton, you will find it at a chemist's on William street. We have none." The chemist on William street did not keep it, deeming it unsafe, and I had to make it myself. You will find my name on the books more or less ever since. I am

Yours respectfully,

JEX BARDWELL.

DETROIT, May 23, 1889.

SCIENCE AND ART.

BY DR. P. H. EMERSON.

[Read before Camera Club Conference.]

Mr. President, Ladies and Fellow Photographers,—Before beginning this paper I would fain ask of you two things—your attention and your charity, but especially your charity. The reception which you accord me, ladies and gentlemen, assures me you will give both, and I thank you beforehand.

Since all mental progress consists, as Mr. Herbert Spencer has shown, for the most part in differentiation—that is, in the analysis of an unknown complex into known components—surely it were a folly to confuse any longer the aims of Science and Art. Rather should we endeavor to draw an indelible line of demarcation between them, for in this way we make mental progress, and Science and Art at the same time begin to gather together their scattered forces, each one taking under its own standard those powers that belong to it, and thus becoming integrated, and necessarily stronger and more permanent; for evolution is integration and differentiation passing into a coherent heterogeneity. Now, I do not mean to premise that this confusion between Science and Art exists everywhere—it does not. But I feel sure that it exists largely in the ever-increasing body of persons who practice photography. The majority of these have not thoroughly, nay, not even adequately, thought the matter out. It is obvious, then, according to the teachings of evolution, that, if we are to make progress, this differentiation must be made, thoroughly understood and rigidly adhered to by every practitioner of photography. Each one must have his aim clearly stamped upon his mind, whether it be the advancement of Science or the creation of works whose aim and end is to give æsthetic pleasure. Proceed we now to analyze the difference between the aims and ends of Science and Art.

Let us first approach the subject from the scientific standpoint.

Assuming that we have before us a living man, let us proceed together to study him scientifically, for the nonce imagining our minds to be virginal tablets, without score or scratch. Let us proceed first to record the color of his skin, his hair and eyes, the texture of his skin, the relative positions of the various orifices in his face, the number of his limbs, the various measurements of all these members. So we go on integrating and differentiating until we find that we have actually built up a science—ethnology. If we pursue the study, and begin to compare different races of men with each other, we find our ethnology extends to a more complex anthropology.

We next observe that the eyelids open and close, the lips open, sounds issue from the mouth, and our curiosity leads us to dissect a dead subject, and we find that beneath the skin, fat and superficial *fasciæ* there are muscles, each supplied with vessels and nerves. We trace these vessels and nerves to their common origins, and are led to the heart and brain. In short, we find the science of anatomy grows up under our hands, and if we go on with our studies we are led into microscopy. Then we begin to ponder on the reasons why the blood

flows, on the reasons why the *corrugator supercilii* and *depressores anguli oris* act in weeping, the *musculus superbus* in practical arrogance, and the *lavator anguli oris* in snarling or sneering. So we go on studying the functions of all the organs we find in our man, and lo! we are deep in physiology; and if we go deeply enough, we find the thread lost in the most complex problems of organic chemistry and molecular physics. And so we might go on studying this man; and if our lives were long enough, and if we had capacity enough, we should be led through a study of this man to a knowledge of all physical phenomena, so wonderful and beautiful is the all-pervading principle of the conservation of energy, and so indestructible is matter. As we proceeded with our studies we should have been observing, recording, positing hypotheses, and either proving or disproving them. In all these ways we should have been adding to the sum of knowledge. And in the greatest steps made in our advancement we should have made use of our constructive imagination — the highest intellectual power, according to recent psychologists.

The results of these investigations, if we were wise, would have been recorded in the simplest and tersest language possible, for such is the language of Science. It is needless to point out that in these records of our studies, as in the records of all scientific studies, too many facts could not possibly be registered. Every little fact is welcome in scientific study, so long as it is true. And thus the humblest scientific worker may help in the great work; his mite is always acceptable. Such is, alas! not the case with that jealous goddess, Art. She will have nothing to do with mediocrity. A bad work of art has no *raison d'être*. It is worse than useless; it is harmful.

To sum up, then, "Science," as Professor Huxley says, "is the knowledge of the laws of Nature obtained by observation, experiment and reasoning. No line can be drawn between common knowledge of things and scientific knowledge; nor between common reasoning and scientific reasoning. In strictness, all accurate knowledge is Science, and all exact reasoning is scientific reasoning. The method of observation and experiment by which such great results are obtained in Science is identically the same as that which is employed by every one, every day of his life, but refined and rendered precise."

Now let us turn to art, and look at our imaginary man from the artistic standpoint. Assuming that we have learned the technique of some method of artistic expression, and that is part of the science we require, we will proceed with our work.

Let us look at the figure before us from the sculptor's point of view. Now what is our mental attitude? We no longer care for many of the facts that vitally interested us when we were studying the man scientifically. We care little about his anatomy, less about his physiology, and nothing at all about organic chemistry and molecular physics. We care nothing for his morality, his thoughts, his habits and customs — his sociological history, in fact; neither do we care about his ethnological characters. If he be a good model, it matters little whether he be Greek, Italian or Circassian. But we do care, above all, for his type, his build, and the grace with which he comports himself; for our aim is to make a statue like him, a statue possessing qualities that shall give æsthetic pleasure. For the *raison d'être* of a work of art ends with itself; there should be no ulterior motive beyond the giving of æsthetic pleasure to the most cultivated and sensitively refined natures.

The first thing, then, we must do, is to sit in judgment on our model. Will he do for the purpose? Are his features suitable? Is he well modeled in all parts? Does he move easily and with grace? If he fulfills all these conditions we engage him. Then we watch his movements and seize on a beautiful pose. Now with our clay we begin to model him. As we go on with our work we begin to see that it is utterly impossible to record all the facts about him with our material, and we soon find it is undesirable to do so—nay, pernicious. We cannot model those hundreds of fine wrinkles, those thousands of hairs, those myriads of pores in the skin that we see before us. What, then, must we do? We obviously select some facts—the most salient, if we are wise—and leave out the rest.

All at once the fundamental distinction between Science and Art dawns upon us. We cannot record too many facts in Science; the fewer facts we record in Art, and yet express the subject so that it cannot be better expressed, the better. All the greatest artists have left out as much as possible. They have endeavored to give a fine analysis of the model, and the Greeks succeeded.

It is beside the question to show how Science has exerted an injurious influence upon certain schools in art; but that would be very easy to do. At the same time, the best art has been founded on scientific principles—that is, the physical facts have been true to nature.

To sum up, then, Art is the selection, arrangement and recording of certain facts, with the aim of giving æsthetic pleasure; and it differs from Science fundamentally, in that as few facts as are compatible with complete expression are chosen, and these are arranged so as to appeal to the emotional side of the man's nature, whereas the scientific facts appeal to his intellectual side.

But, as in many erroneous ideas that have had currency for so long there lurks a germ of truth, so there lurks still a leaven of Art in Science and a leaven of Science in Art; but in each these leavenings are subordinate, and not at the first blush appreciable. For example, in Science the facts can be recorded or demonstrated with selection, arrangement and lucidity; that is the leaven of Art in Science. Whilst in Art the physical facts of nature must be truthfully rendered; that is the leaven of Science in Art.

And so we see there is a relationship between Science and Art, and yet they are as the poles asunder.

II.

We shall now endeavor to discuss briefly how our remarks apply to photography. Any student of photographic literature is well aware that numerous papers are constantly being published by persons who evidently are not aware of this radical distinction between Science and Art.

The student will see it constantly advocated that every detail of a picture should be impartially rendered with a biting accuracy, and this in all cases. This biting sharpness being, as Mr. T. F. Goodall, the landscape painter, says, "Quite fatal from the artistic standpoint." If the rendering were always given sharply, the work would belong to the category of topography or the knowledge of places—that is, Science. To continue, the student will find directions for producing an unvarying quality in his negatives. He will be told how negatives of low-toned effects may be made to give prints like negatives taken in bright sunshine; in short, he will find that these writers have a scientific ideal, a sort of standard negative by which to gauge all others. And if these writers are ques-

tioned, the student will find the standard negative is one in which all detail is rendered with microscopic sharpness, and one taken evidently in the brightest sunshine. We once heard it seriously proposed that there should be some sort of standard lantern slide. My allotted time is too brief to give further examples. Suffice it to say, that this unvarying standard negative would be admirable if Nature were unvarying in her moods; until that comes to pass there must be as much variety in negatives as there are different moods in Nature.

It is, we think, because of the confusion of the aims of Science and Art that the majority of photographs fail either as scientific records or works of art. It would be easy to point out how the majority are false scientifically, and easier still to show how they are simply devoid of all artistic qualities. They serve, however, as many have served, as topographical records of faces, buildings and landscapes, but often incorrect records at that. It is curious and interesting to observe that such work always requires a name. It is a photograph of Mr. Jones, of Mont Blanc, or of the Houses of Parliament. On the other hand, a work of Art really requires no name—it speaks for itself. It has no burning desire to be christened, for its aim is to give the beholder æsthetic pleasure, and not to add to his knowledge or the Science of places, *i. e.*, geography. The work of Art, it cannot too often be repeated, appeals to man's emotional side; it has no wish to add to his knowledge—to his Science. On the other hand, topographical works appeal to his intellectual side; they refresh his memory of absent persons or landscapes, or they add to his knowledge. To anticipate criticism, I should like to say that of course in all mental processes the intellectual and emotional factors are inseparable, yet the one is always subordinated to the other. The emotional is subordinate when we are solving a mathematical problem, the intellectual is decidedly subordinate when we are making love. Psychologists have analyzed to a remarkable extent the intellectual phenomena, but the knowledge of the components of the sentiments or the emotional phenomena is, as Mr. Herbert Spencer says, "altogether vague in its outlines, and has a structure which continues indistinct even under the most patient introspection. Dim traces of different components may be discerned; but the limitations both of the whole and of its parts are so faintly marked, and at the same time so entangled, that none but very general results can be reached."

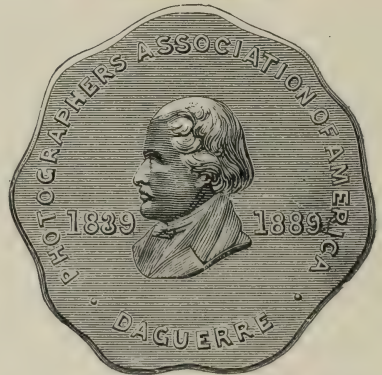
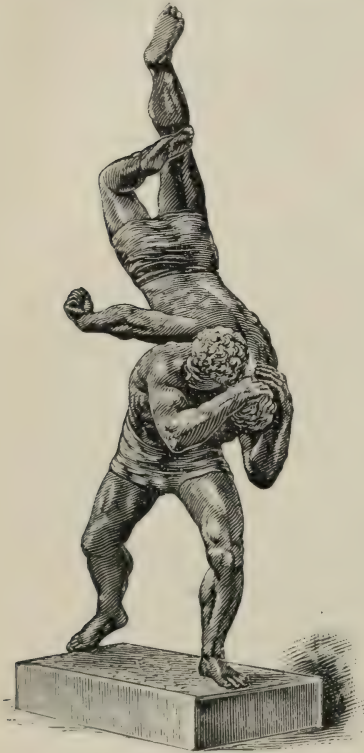
The chief thing, then, that I would impress upon all beginners, is the necessity for beginning work with a clear distinction between the aims and ends of Science and Art. When the art student has acquired enough knowledge—that is, science—to express what he wishes, let him, with jealous care, keep the scientific mental attitude, if I may so express it, far away. On the other hand, if the student's aim is scientific, let him cultivate rigidly scientific methods, and not weaken himself by attempting a compromise with Art. We in the photographic world should be either scientists or artists; we should be aiming either to increase knowledge—that is, science—or to produce works whose aim and end is to give æsthetic pleasure. I do not imply any comparison between Science and Art to the advantage of either one. They are both of the highest worth, and I admire all sincere, honest and capable workers in either branch with impartiality. But I do not wish to see the aims and ends of the two confused, the workers weakened thereby, and, above all, the progress of both Science and Art hindered and delayed.

(To be continued.)

THE PRIZES TO BE WON AT BOSTON.

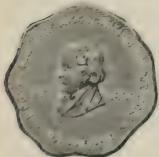
THROUGH the kindness of Mr. McMichael, the President of the Photographers' Association of America, we are able to give our readers illustrations of the bronze group and medals to be given to the successful competitors at the Boston Convention in August next.

The bronze figure is the "Roman Wrestlers," about three feet high, and the illustration gives an excellent idea of the group.



The medals are made by Tiffany & Co., of New York, and are to be of fine gold, finished in dead gold. We give above cuts of the two faces of the medals.

There will also be a very handsome souvenir of the Convention in the shape of a members' badge, made in solid silver, oxidized, an illustration of which we also give.



There is every probability that the Convention in Boston will be a memorable one, and every photographer who can possibly spare the time should make an effort to be present. It will be something to remember in after years.

THE BERLIN JUBILEE EXHIBITION.

EXHIBITS for this exhibition have already arrived in New York, and we would remind our readers that the shipment will be made about August 1st, in order to have the pictures arrive in Berlin in time for the opening of the exhibition. Those who intend to take part should send their pictures to our publishers at *once*. Exhibits must be prepaid to Berlin.

OUR ILLUSTRATION.

THE handsome frontispiece which adorns this issue of the BULLETIN is from the studio of the well known New York artist, Dana. We need not say it is a gem of art photography, for it tells its own story in this respect. Following in the footsteps of the true artist, Mr. Dana has taken up this part of the human form as a study, and the singularly beautiful results obtained are a brilliant testimonial to his skill as a photographer and handsome witnesses to his cultured artistic feeling.

ANTHONY'S PRIZES FOR BROMIDES.

OUR publishers offer for competition at the Boston Convention of the Photographers' Association of America, August 6 to 10, 1889, the following prizes for the users of Anthony's Reliable Bromide Paper :

For the best collection of Plain Enlargements and Contacts.....\$100

For the best collection of Crayon Worked Enlargements..... 50

The conditions for competition will be as follows :

First—For the \$100 prize the prints must be at least six in number and must embrace both Contacts and Enlargements.

Second—The awards will be made for the best collection as a whole.

Third—Competitors must forward their exhibits prepaid so that they will reach Boston by the first of August.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a card stating the name and address of the exhibitor and his private mark, a letter being sent also with same private mark, but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. Applications for space must be sent to the Secretary of the Association, Mr. O. P. Scott, 2220 Indiana avenue, Chicago, Ill.

E. & H. T. ANTHONY & Co.

AIR BRUSH MANUFACTURING COMPANY'S PRIZES.

THE Air Brush Manufacturing Company will offer the following prizes at the Convention of the Photographers' Association of America, to be held in Boston, August 6 to 10, 1889 :

First.—One complete Air Brush will be given for the best free-hand portrait done with the Air Brush. This may be in black and white or water colors.

Second.—One complete Air Brush will be given for the best water color portrait, over any print, finished with the Air Brush.

Third.—One complete Air Brush will be given for the best portrait in black and white, over any print, finished with the Air Brush.

A NEW PRINTING PROCESS.

To the Editors of Anthony's BULLETIN :

Please find inclosed sample proofs of a new contact printing process. Some are like proofs on double albumenized paper, others like plain mat surface, all apparently highly toned. I would state that there is no iodide, bromide or chloride of silver used in the process, consequently no gold toning or hyposulphite of soda is used ; it is not a photo-mechanical process, but simply a new departure with old photo materials. The paper only requires one minute exposure to sunlight. As to the keeping qualities of paper or proofs, this has to be tested. The solution can be used on celluloid or on wood blocks for engraving. I am still experimenting further with the process.

Yours respectfully,

T. C. ROCHE.

The proofs submitted fully corroborate all Mr. Roche's statements.—ED.

GOOD WORDS FOR "THE INTERNATIONAL ANNUAL."

I AM thoroughly well pleased with the volume.

W. CHAMBERLAIN, *Cranford Camera Club.*

I AM satisfied that it equals if it does not excel Vol. I, its predecessor.

JEX BARDWELL, *Detroit.*

"THE International Annual" for 1889-90 is a volume of some 500 pages, filled with articles by leading photographic writers in all parts of the world, touching upon all branches of the art, and contains artistic prints illustrative of the different processes in the volume. It is not a mere compilation of technical matter, but contains many articles interesting to the general reader.—*Boston Herald.*

We have been favored with an early copy of the second volume of the "Annual," which achieved such a signal success last year. The reputation then established is well maintained by the present volume. One hundred and eighty articles, on almost every branch of photography, fill 415 pages of closely printed matter, and make a book which will prove helpful to every worker.—*American Amateur Photographer.*

The advances of photography are well indicated in the "International Annual of Anthony's Photographic Bulletin," which has just appeared. The volume is admirably edited by W. Jerome Harrison, F.C.S., of Birmingham, Eng., and A. H. Elliott, Ph.D., F.C.S., of New York, both men of the fullest information on photographic matters, and in every respect well fitted to co-operate in the preparation of so entertaining and so useful a volume. Photographers, professional and amateur, are increasing so greatly in numbers that there must be a constantly enlarging audience for books of this kind, in which experts and connoisseurs in various branches of photography have expressed opinions on various themes, generally with interesting brevity. An immense number of topics are touched upon, and adequate diagrams are brought in play in emphasizing points made by the writers. Individual opinion is not interfered with by the editors, so that the effect is that of a technical and sometimes artistic symposium. Some of the writers are dogmatic, but the majority, perhaps, is a liberal one, and the effect of the volume as a whole is that of an honest search for truth and right principle in the prosecution of an exacting and rapidly developing art. The addition of several prints and photo-gravures gives not a little pictorial charm to the book.—*Brooklyn Times.*

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

CINCINNATI CAMERA CLUB.

THE Club took their annual "outing" May 30th, and, notwithstanding a heavy rain, about eighty attended. It was a poor photographic day, but those who went were amply repaid by the social enjoyment of the occasion.

Our first meeting in June was well attended. Mr. BULLOCK occupied the chair. It was suggested that the Club take a number of "outings" during the summer months, to be conducted by volunteer members; this met with great favor, and immediately the excursions were provided for. Mr. JOHNSON showed a circular level, which was of great interest, and was pronounced of advantage to the worker both for its accuracy and convenience. Mr. BARTON read a paper on composition, with charcoal illustrations.

On June 17th the second meeting was called to order, with *Vice-President* FISHER in the chair. A question of having one meeting instead of two for the months of July and August was brought up, and decided that as the times for meetings were fixed by a constitutional provision, no action should be taken.

Prints from negatives made at the "outing" were shown, and it is remarkable that, bad as the day was, many choice pictures were made, notably those of Messrs. Johnson, Collier, Gibert, Bartlett and others. Mr. HOWARD KINGSBURY, of the Philadelphia Society, entertained the Club with a paper on "Luray Cave and the Theory of its Formation," with lantern illustrations. Mr. Kingsbury showed himself to be thoroughly competent to handle the subject, both descriptively and illustratively. All the pictures were made by the use of the electric light, some requiring twelve hours' exposure, giving some idea of the time and patience exercised to secure them. A vote of thanks was tendered by the Club, coupled with an invitation to meet with us again.

The Club adjourned early, and spent a social hour before separating.

H. C. FITHIAN,

Corresponding Secretary.

COLUMBUS CAMERA CLUB.

ON the 28th of June "Illustrated Boston" was exhibited to the members of our Club and their friends, and was very much enjoyed and praised by all at the entertainment.

Our Club is hard at work, and by next fall hope to have "Illustrated Columbus" ready for the road.

G. Y. ANDERSON,

Secretary.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE regular monthly meeting of the Pacific Coast Amateur Photographic Association was held June 6th, with *President* RUNYON in the chair and Mr. KNIGHT WHITE as *Secretary*.

A resolution was passed admitting ten members at fifty dollars each to life membership, the proceeds to be used as a room fund.

Mr. ECKERT, of the Mechanics' Institute, appeared before the Association, to see if the members would not be willing to give a slide entertainment during the Mechanics' Fair. While the members showed a lively disposition to do as requested so far as they could, the proposition was left to the Executive Committee, with power to act.

In response to the prize competition for studies suggested by Longfellow's "Building of the Ship," only two pictures were received. It is to be regretted that they were withdrawn on account of non-competition, for they were both excellent. Had there been lively competition, it had been the intention of the Association to publish the study considered by the

judges as the best, and to furnish each member with a copy made by reproduction. The original was to be framed and hung upon the walls of the rooms of the Association.

This suggests that did each Association in this country give a subject for competition among its own members, publish the photograph of the successful competitor, and exchange with the different societies, artistic effort would be stimulated, each member would try to rival his fellows, and each society would endeavor to produce that picture which should be finally decided to be the most successful of all presented.

A Committee was appointed to revise the Constitution and By-Laws of the Association. This important work is necessary because of the rapidly increasing membership. At present none but amateurs can become members, and there are certain restrictions against any member selling his work. In the revision, it will probably be decided whether it is advisable to admit professional photographers, and also whether there is a sufficient number of lady amateurs in San Francisco to warrant the Society in making special provisions and arrangements for their membership.

A. J. TREAT,

Corresponding Secretary.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, June 5, 1889, with the President, FREDERIC GRAFF, in the chair.

The Secretary reported the death of Mr. Charles F. Butler, a member of the Society, who was lost in the disastrous flood at Johnstown, Pa., on May 31st. Mr. Butler held the position of Assistant Treasurer in the Cambria Iron Company, having removed his residence from Philadelphia to Johnstown within a recent period.

The Excursion Committee, through its Chairman, Mr. Samuel Sartain, made a report suggesting a series of three one-day excursions on Saturdays, June 15th, 22d and 29th, probably to different points on Brandywine Creek, Penn. On motion of Mr. Rosengarten the Committee was authorized to arrange and carry out all details of such a programme as proposed above.

The Committee on Joint Exhibition presented the following report:

"The Third Annual Joint Exhibition of the Society of Amateur Photographers of New York, The Photographic Society of Philadelphia and the Boston Camera Club was

held in the galleries of the Pennsylvania Academy of the Fine Arts, Philadelphia, April 8 to 20, 1889, under terms of agreement and rules adopted at a meeting of representatives from the three Societies held in New York, October 22, 1886, revised and amended November 10, 1888.

"By the revised and amended rules definite regulations were adopted for holding and governing such meetings of the Joint Exhibition Council as may be deemed necessary.

"All entry of exhibits by classification was abolished, and the awarding of diplomas by classification was limited to the seven diplomas for 'special excellence' reserved for the recognition of exceptional merit in certain principal lines of photographic work, one diploma being placed at the disposal of the judges for each of the seven classes.

"Your Committee believes that critics generally recognized a marked improvement in the quality of the pictures exhibited by all participants. The increased proportion of bromide and platinum prints was noticeable over former exhibitions, and indicates a change of taste from the warm tones and glossy surface of the albumen print to something more permanent and more pleasing to the eye of the artist. An even greater revolution may be expected within the next year, owing to the introduction of the cold process in platinum-type printing, and in the new toning of plain silver prints with a platinum salt.

"The aristotype and prints made from negatives on orthochromatic dry plates, and prints from celluloid films, were among the newer features of the exhibition. The exhibits of pictures made with detective cameras were interesting in many respects, and no doubt furnish valuable studies for an artist; but in close comparison with larger and direct prints from negatives made with time exposure, they suffer in respect to technical qualities and the careful composition so important to a photographic picture. It is to be hoped that the ease and fascination of hand camera work will not induce photographers to neglect the use of the larger plates or films, which, though entailing more cost, care and labor, repay it all in more satisfactory and pleasing results. We are informed by one of our foreign exhibitors that among landscape photographers of England who aspire to pre-eminence in their art, larger plates are now in use than ever before.

"Exhibitions of lantern slides were held upon Tuesday and Thursday evenings of each

week. The improvement in the quality of gelatine lantern slides was marked and encouraging; also the uniform size of slides and neatness in mounting—qualities no doubt engendered by the labors of the American Lantern Slide Interchange.

"The local Committee in immediate charge of the exhibition were assigned by Messrs. H. T. Duffield, of New York, and E. F. Wilder, of Boston, through their efforts in securing exhibits from their respective cities and societies.

"By special resolution of the Joint Exhibition Council, the Board of Judges was to consist preferably of 'three artists of acknowledged ability, at least one of whom shall be well versed in practical photography, and two expert practical photographers.' The Committee of Arrangements selected for this purpose the following gentlemen: John C. Browne, George W. Hewitt, J. B. Sword, Xanthus Smith and Fred. B. Schell.

"Special thanks are due to these gentlemen for their valuable time given to a critical examination of every exhibit, and the most impartial and satisfactory decision rendered by them. Mention must be made of the kind and valuable services of Mr. Frank Bement in loaning and operating his oxy-hydrogen lantern, and Messrs. George B. Wood, George Vaux, Jr., H. H. Suplee and Dr. C. L. Mitchell, who very kindly described the lantern slides upon the various nights when they were shown.

"While the object of the joint exhibitions is not that they shall serve as a source of revenue to the societies interested, it is gratifying to your Committee to be able to report that the late exhibition was pecuniarily a success.

"The experiment of conducting the exhibitions of photographs in the three cities, New York, Boston and Philadelphia, annually, and in rotation under the same rules and management, now having been given a trial by each of the societies, a proper time has arrived for considering the question of the desirability of a continuation of the plan and agreement. The benefits which have accrued from the co-operation are very apparent; the objects of such exhibitions are identical in each society, and the limitation of one exhibition to each city once in three years keeps fresh and increases the interest taken in them by the public and by contributors.

"The three societies now so fully understand and agree upon the general object of the exhibitions, it may be well before entering upon another three years series for each so-

ciety to consider whether the plan adopted shall be continued in its present shape of Joint Exhibitions, or whether they would prefer to conduct future exhibitions each under its own rules, confining the agreement simply to holding the exhibitions annually in rotation in one of the three cities under the control of the local organization. If continued as a joint arrangement it would seem desirable that a medal be adopted for distribution at future exhibitions in place of diplomas. A medal is the time-honored token for award in recognition of high merit. It is recognized as such in all countries, and conveys an idea of value and dignity which a mere written document or instrument can never equal.

[Signed] JOHN G. BULLOCK,
ROBERT S. REDFIELD,
SAMUEL M. FOX,
Committee on Joint Exhibition."

The Treasurer's report showed a balance to be placed to the credit of the Society over and above all expenses on account of the exhibition of about \$250.

On motion of Mr. Wood the report was accepted, and the funds in the hands of the Committee were ordered to be turned over to the Treasurer.

Dr. Mitchell moved that a vote of thanks be tendered to the Committee for their labors on behalf of the Society, and also to the Board of Judges for their efficient and valuable services. (Carried.)

Mr. Bullock, for the Committee, also reported that the exhibits of Messrs. W. W. Winter, of Derby, and Mr. Auty, of Tyne-mouth, England, had been presented to the Society, for which votes of thanks were passed.

Mr. J. G. Martin showed one of Beck's new combination lenses, arranged for foci of 5, 7 and 9 inches, and for plates from 4 x 5 in. to 5 x 8 in. He also showed a small lens of 4 in. focus, and a wide angle lens 11 in. focus, for 14 x 17 plates. All of these lenses were supplied with the Iris diaphragm.

A number of excellent pictures made with the use of Pine's flash-light apparatus were also shown by Mr. Martin.

Dr. Mitchell described two brands of aristotype paper, with which he had been experimenting; one of American make, coated, he believed, with a collodion emulsion, and a foreign paper coated with gelatine. He illustrated his remarks with several prints made on the two varieties of paper.

Mr. Graff showed a circular which was of interest in connection with the revival in the use of magnesium light in photography. It

was dated March 18, 1869, and consisted of an invitation to be present at a practical test of "Proctor's Patent Night Photography Invention," a description of which would be found on page 38 of the February, 1869, number of the *Philadelphia Photographer*. A cut on the circular showed a tent-like structure, forming an apartment in which the sitter was evidently placed and illuminated by the burning magnesium. Through a large, round opening in the end of the tent a portrait camera was pointed, with which the picture was taken.

He also showed some interesting prints, made by Taber, of San Francisco, of an eclipse of the sun.

Adjourned.

ROBERT S. REDFIELD,
Secretary.

LOWELL CAMERA CLUB.

THE Lowell Camera Club held their first field-day on June 13th. A good-sized party started early in the afternoon on a barge for an outing with their cameras. Beaver Brook was the first point of interest. A view down the brook near the paper mill was selected by the Committee of Arrangements and each member tried his skill at picture making on this subject. On the way to Richardson's Brook, the next point of interest, the party stopped to get a cattle picture. A fine herd of cattle in a very picturesque pasture afforded a great variety of pleasing groups. A good deal of care was necessary before each photographer was able to secure a satisfactory picture. One of the most desirable groups dispersed just as an anxious artist was ready to draw the slide. Finally all succeeded in exposing plates upon good subjects and the Club again mounted the barge for Richardson's Brook. This brook is a favorite resort for artists with brush or camera. Good subjects for pictures are easy to find there. A Club group picture by each member ended a very pleasant day's outing. Sets of views taken on this field day are to be printed for joint exhibition.

GEORGE A. NELSON,
Secretary.

NEW ORLEANS CAMERA CLUB.

THE regular monthly meeting of the New Orleans Camera Club was held June 19th at the office of the genial *Treasurer*, P. E. CARRIERE.

Vice-President HINCKS was in the chair and sixteen members present.

The financial reports of Messrs. George Bullock and F. C. Beach, managers of the American Lantern Slide Interchange, were received, also valuable suggestions regarding work to be contributed next year, when no doubt all the work submitted by the various photographic societies of the United States will far excel in artistic merit, interesting features and technical qualities those of last year.

The Committee appointed to look for suitable club rooms reported through their chairman, Mr. T. W. Castleman, and asked for further time, which was granted.

The Committee on outing to Biloxi over the line of the Louisville and Nashville Railroad, after mature deliberation, recommended a postponement until later in the fall, and it was so decided.

The resignation of Mr. J. B. Labouisse was accepted with regrets. Mr. Labouisse leaves shortly for Boston, to complete a course of study in practical electricity.

The applications for membership of Messrs. L. A. Jung, W. M. Rhodus and Louis E. Cormier were received, and they were duly elected.

The report of Treasurer P. E. Carriere was read, and showed a handsome balance in the treasury.

The report of Secretary Charles H. Fenner was received, and showed sixty-four active, four corresponding and nine honorary members.

The regular weekly meetings have been dispensed with until permanent quarters are secured.

In the fall the Club proposes to give a grand lantern slide exhibition for its own benefit, the proceeds of the benefit to be used in furnishing and fitting up the new quarters which by that time it hopes to possess. It goes without saying that a club having as many staunch friends and admirers as the New Orleans Camera Club will realize a handsome sum.

[From *Wilson's Photographic Magazine*.]

THE LILLIPUT CAMERA.

"* * * all the apparatus of the system, and its varied workings, end in simply bringing twelve good men into a box."—LORD BROUGHAM.

ANOTHER tiny camera lies upon our table, as full of possibilities as any other baby; as dangerous as dynamite, and as far-reaching and unerring as the lasso of a cow-boy. It comes from a well-known house, whose cameras of infinite style are scattered all over the world, and it has come to assert itself and make a place permanently among its kin-

dred. It is "the baby of them all," but it is likewise destined to become a leader.

We allude to the "Lilliput" camera recently introduced by the manufacturers, Messrs. E. & H. T. Anthony & Co., No. 591 Broadway, New York. What appears to the eye is but the outward apparel of the little thing—a sole-leather case 4 x 4 x 6 inches in size, with a leather strap for carrying the camera upon the shoulder—and seems as harmless and innocent as any sweet baby one may stop to smile upon as its nurse perambulates it through the winding paths of Union Square, just underneath our office window. But as in one case, so in the other, the active, secure-whatever-it-wants business elements are plentiful inside, and require but little to start them going. A camera-obscure (cone-shaped), a fine lens, a spring drop-shutter which one can "set" either for "instantaneous" or "time" exposures, and six good double holders, make up the "works," and, as we have said, there is no end to the things possible to secure by their combined and proper use. Many advantages attend such a camera. It is about as near "secret" as anything can be and secure pictures of an advantageous size. All the employment of the hands required to "set" and to expose the camera is done underneath the case, and it could be so hidden by a handkerchief that not even the motions of the hands need be seen. As the plates are exposed, the holders are marched to the rear; a fresh one is ordered to the front, is "fired," and in turn falls back to the rear of its predecessors. By the ingenious method adopted by the makers, of coloring the caps of the plate-slides differently, the operator is sure to deploy his plates in order and to secure their exposure in turn. The same means apprise him—automatically, in fact—when the ammunition is exhausted, when to fall back and replenish, without being submitted to the mortification and ruin liable to follow the presentation of a used cartridge to the retreating enemy. Soon after ours came we sat down quietly, after a morning of exhaustive editorial work, and proceeded to make ourselves acquainted with it, as we would with anything else little—cautiously, tenderly. In looking about for the trigger, we unwittingly touched it underneath, and snap it went, as ill-naturedly as a dynamite cartridge. But we understood each other after that, and have become intimate. What may we not do with it? The manufacturers say, among other things, that "scenes peaceful and riotous" may be secured with it. How like a baby again! The fact is that it

may be made to conquer anything that any camera can reach, and much more. You may make few or many pictures with it, or "end in simply bringing twelve good men (or subjects) into a box," as Brougham declared was the "end" of "all the apparatus" of the law "and its varied workings." Whenever your picture-gathering is over, you may quickly see what you have secured, without waiting until a large number are made. The plates are supplied at twenty-five cents per dozen, and are of glass. Two simple actions only are required to expose a plate—simpler far than compressing and releasing a rubber bulb. The lens is an excellent one, always in focus. The price, \$25, covers the cost of the camera, strap and case complete; six patent double holders, nine dozen dry plates, and a pocket ruby lamp. How complete and how compact!

One of the charms of the "Lilliput," like that of any other "wellspring of pleasure," is that it is quite as entertaining at night and as active as in the daytime. Provide yourself, in connection with the "Lilliput," with "The Mize Pocket Repeating Flash Lamp," which may be operated in the hand at any angle, and you can snap your finger at sunlight, for all you need to make pictures is at your hand. Surely the "Lilliput" will become as great a photographic power as the other baby.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

DISCUSSION ON NEGATIVE FILMS.

(Continued.)

The *President*—Experience seems to be a little contradictory.

Mr. CHAMPNEY—It is not so contradictory, it seems to me.

The *President*—I would like to know Mr. Newcomer's idea in that respect.

Mr. NEWCOMER—I put a film in a tray of water for an hour, and the result was it looked like a strong attack of small-pox. The gelatine was pitted at the end of that time. (Laughter.)

Mr. DUFFIELD—I suppose the film was also pitted. (Laughter.)

Mr. BARCKALOW—I have had a similar experience.

The *President*—I think if Mr. Newcomer had exhibited that pitted film to Dr. Nagle as a health officer, he would have got in trouble. (Laughter.)

Mr. NEWCOMER—I hung out a red light. (Laughter.)

The *President*—An order of *nolle pros.* is entered. (Laughter.)

A *Member*—I think we might have some of these films here, Mr. President.

The *President*—I would be glad to have Mr. Leaming's view in regard to the matter.

Mr. LEAMING—I had only a few, not over three dozen; they were $6\frac{1}{2} \times 8\frac{1}{2}$ in size. I treated them all in a similar manner, and the first dozen came out without any noticeable spots, and the last two dozen I found more or less spotted, and I wetted them in each case before developing.

The *President*—Well, I think this affords a good ground for investigation still further.

Mr. A. L. SIMPSON—The only experience I have in regard to the matter is, that I had the same thing happen in plates by allowing the developer to stand quietly.

Mr. DUFFIELD stated that hydroquinone did better by being left quiet than it did by agitating it.

Mr. HILLS—Mr. President, I would like to hear if when the members found spots whether they think they were of late development, or whether they have found them in winter, more or less.

The *President*—Mr. Hills desires to know whether the spots were of a recent crop, or whether they were old and long standing. What has been Dr. Nagle's experience in regard to that?

Dr. NAGLE—Mine were very recent, Mr. Chairman. I requested the Secretary to buy some, and they came directly from Scovill's.

Mr. HILLS—The reason that I inquired was this: From my slight experience distilled water is about the safest kind of water to be used from the time the plate is exposed until it is thoroughly fixed, as in the spring you will find all the water that is furnished by water-works is filled with a great many impurities. This is especially so in the spring-time.

The *President*—That, I think, is a very valuable suggestion of Mr. Hills—the possible contamination of the water supply is one explanation of these spots. I might inquire of Mr. Newcomer if this thing occurred in the country or in the city.

Mr. NEWCOMER—Yes, in the city; I had reference to the Eastman film and the Eastman bromide paper.

Mr. DUFFIELD—What developer did you use—was it the ferrous oxalate?

Mr. NEWCOMER—Yes, sir; ten per cent. of ferrous oxalate—I tried them all, and not only one kind of paper, but I tried several different emulsions.

The *President*—To change the direction of the proceedings just a little; I notice a very convenient application of these films from which the emulsion had been cleared by hot water, and that was in using them instead of ground glass, against which was placed a positive common glass as a sort of backing. The coloring is another point regarding these films which has occurred to me, although I have not personally carried it out, and that is their convenience in making diagrams by persons for the purpose of exhibiting as lantern slides. They are very excellent in that respect. Sometimes you want to write a few words in a hurry, and I think that is a very valuable application of the use of the film.

Mr. DUFFIELD—Mr. Barckalow, a member of this Society, I believe, broke the ground glass in his camera a short time ago, and he took a film and used it instead of the ground glass. Judging from his experience, it would be a good thing to take a film around in one's pocket.

Mr. SCHRAM—Mr. Chairman, I would like to ask how that film was fastened.

Mr. BARCKALOW—I will state that I simply took out the ground glass and inserted the film. It would not stay fixed in there, but I found it worked very nicely.

Mr. BIRDSALL—I might possibly give the members some points on the water of New York City. I think the condition of the Croton water of New York City—in fact, I am pretty sure of it—depends on the seasons. That is, it is not any more likely to be bad in the spring than it is in the fall, but its condition depends more on the quantity of water than upon the season. After we have had a drought some time, and the large storage reservoirs have been run down a little, then the water appears to undergo a sort of fermentation, and after this period the water is very much charged with organic matter; and of course, when that water is flowed into a plate, it will produce air bubbles. I have noticed that the water in the past six months has had no tendency to develop air bubbles. During part of the last summer and the year before that there was a great deal of trouble of that kind. Probably the manipulation of the plates might be facilitated by getting bulletins from the Department of Public Works as to the condition of the water. (Laughter.)

The *President*—These are the results of experiments on the water, are they?

Mr. BIRDSALL—Well, I have experimented with water, and I have facilities for knowing the condition of the water. I can furnish

those bulletins if the Society would like. (Laughter.)

The *President*—We are getting down nearer to the cause.

Mr. DUFFIELD—I would state for the information of some of the members who have recently come into the Society that there is always a plentiful supply of distilled water at the rooms for their use, so that in making up their developers there is no necessity of their using the tap water.—Discussion closed.

REGULAR MEETING, TUESDAY, MAY 14, 1889.

The meeting was called to order at 8.15 P. M., *President* CANFIELD in the chair.

The *President*—I have the pleasure of introducing Mr. Charles J. Bates, of this city, who will give us a paper on "A Method of Making Dark Blue-Prints" (see page 371). He has had a good deal of practical experience and knows what he is talking about and will be interesting to listen to. The question of toning blue-prints is a very interesting subject and we have not come to a satisfactory conclusion yet. This is a very important clue towards a satisfactory solution. We are certainly very much obliged to Mr. Bates for his kindness in showing us his results.

The members elected since the last meeting are: G. W. Murdock, M.D., Cold-Spring-on-Hudson, Corresponding; Henry Brodhead, New York, Active; A. S. Murray, Baltimore, Corresponding; A. P. Schoen, New York, Active; Arthur Lumley, New York, Corresponding.

The members to be elected are: Earnest Warrin, New York, Active; William T. Winttingham, Brooklyn, Corresponding; J. M. Winants, Bergen Point, N. J., Corresponding; H. H. Chittenden, New York, Active.

The *President*—I will now ask Mr. Champney if he will favor us with a few remarks on the book of photography which has lately appeared, and in which he is very much interested—Emerson's "Naturalistic Photography."

Mr. J. WELLS CHAMPNEY—Mr. Chairman, Ladies and Gentlemen:—A few weeks ago Mr. Canfield handed me this book, the leaves of which had not been cut, and he said: "Probably this is the first copy that has arrived in America. Take it home and read it, see if you can find something in it; I am sure you will find very much of interest and possibly instruction." I have read, and re-read, very much of it, and instead of seconding such notices as I have read of it in the

photographic journals, I would like to write a most enthusiastic essay on the meaning that book has to me as a *stimulus*, if nothing else. Not that it is full of truth entirely, and not that the statements are such as an artist can accept. I want to read, with the permission of the President, two or three extracts that you will see are quite theoretical. The work is written by Doctor P. H. Emerson, of England, whose articles many of you have undoubtedly read in various English journals. The position he seems to have taken is a very high one in the relation the amateur should bear to the artistic side of photography, and this book shapes the thoughts he entertains in a very clear and concise way. So that when you leave it you feel benefited photographically and stimulated artistically to do the very best that is in you—and what more can be asked of a book? I want to show you some of the heresies which you will see when I read two or three lines, rather disturbing to some who have been brought up in the old-fashioned way, as I was. He begins the book by starting in a very sensible way with the terminology and the various terms he proposes to use, and the value he, personally, attaches to them, and, if the time were long enough, I could quote some very heretical statements that he has made. He runs through the field of the old artists, from away back in the time that we do not know anything of, except what the stupid Greek writers have seen fit to leave us about the Greeks, for they were always praising things that we know we should not have esteemed ourselves. Most of the art writings of the Greeks were written by men who probably knew nothing further than the average spectator on the street knew about art.

He says: "Raphael and Correggio we will quickly dismiss, though we are fully aware of the £70,000 reputation of the one, and the literary reputation of the other. Raphael does not appeal to us, with his sickly sentimentality, his puerile composition, his poor technique, and his lack of observation of nature."

Any one who is an artist will be very much disturbed by that and be tempted to throw the book over. But this is one of the freshest views of art, from a scientist stand-point, that I have ever read, because I must get out of myself and put myself as far as I can into this new position—and I find it very delightful. I will not read any further extracts from it, because those four lines are enough. But here are three or four lines that are delicious; they are quoted from Millet, and not Dr. Emerson:

"Very few painters are sufficiently careful as to the effect of a picture seen at a distance great enough to see all at once, and as a whole. Even if a picture comes together as it should, you hear people say, 'Yes; but when you come near it is not finished.' Then of another, which does not look like anything at the distance from which it should be seen, 'But look at it near by; see how it is finished.' Nothing counts except the fundamental. If a tailor tries on a coat, he stands off at a distance enough to see the fit. If he likes the general look, it is time enough then to examine the details; but if he should be satisfied with making fine button holes and other accessories, even if they were *chefs d'œuvre*, on a badly cut coat, he will none the less have made a bad job. Is not this true of a piece of architecture, or of anything else?"

There it is put in so simple a way that we can all understand that it is the truth. Then he takes up the various scientific phenomena involved in our photographic work and really makes demands upon the amateur which no one of you could fill. One of you may be scientific enough for him and another of you may know enough of optics, but he would have a better trained man for the work than any man that I have known of; and the claim he makes is that there should not be more than twenty photographs made by an amateur in a year (laughter)—not much over that. Of course he would have the art side of it brought so to the front that we would respect our efforts and never let any one see some that we make by the dozen. Now I could see, after I had gotten half way through this part of the book, that all professional photographers and plate makers must throw this book aside. They are dependent for their existence on the number of photographs which they make; and the professional photographer wants to photograph as many people as he can, and the professional plate makers want them to spoil as many plates as they can, and the doctrines, or rather statements, laid down in the book, I should not imagine would be readily embraced by the professionals; but it is so full of nourishment and stimulus, that you cannot but feel that with all the writer's enthusiasm he is perfectly genuine. (Applause.)

Mr. CHAMPNEY—You won't need any other book in your library this summer if you take that book.

Mr. Newcomer stated in substance that he thought that the amateur must necessarily spoil a great many plates in order to learn the art of photography.

The *President*—A great many of the developments and exposures must be purely experimental; but so far as that is concerned, they can be stacked up on the shelves, but not be shown as pictures.

Mr. CHAMPNEY—You must go to school and learn photography, no matter what it costs.

The *President*—My own feeling about a matter of that sort is, that the beginner in photography knows too little what he is striving at, and that he is unable to recognize his results if he should, by chance, happen upon them—he would not know those things he is seeking for. That was my experience in my early negative work. I didn't know a good negative when I saw it.

(To be Continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—P. W. writes: Please give me the correct or modern names of the two following chemicals: aqua vitæ and Roman vitriol?

A.—This question has been delayed because the letter was misplaced and has only now been found. Aqua vitæ is the old name given to spirits of wine or alcohol. Roman vitriol is probably common crystallized protosulphate of iron (ferrous sulphate); we are not quite sure about this.

Q.—A. S. writes: For the past two weeks I have been troubled with blisters on my albumen paper and cannot stop their formation. I use weak hypo, correct the temperature of the bath by adding warm water, and use common salt in the first washing after the hypo. The prints begin to blister in the hypo. Please tell me a remedy.

A.—Use a salt bath before the hypo, and then use the hypo cool, not over 65 degrees Fahr., and finally use the salt bath again after the hypo. The trouble is probably due to the hypo bath being too warm. You may also put a little alum into the salt bath before the hypo.

Q.—W. S. writes: I beg leave to ask your assistance in dry plate making. I did my best

to make an emulsion after Obernetter, but it was almost insensitive. Then I tried to make it more sensitive with potassium bromide and iodide; but it takes about two minutes to obtain an impression in full sunlight. You would greatly help me if you can tell me how to make this emulsion more sensitive.

A.—Your trouble is probably due to incomplete washing of the emulsion, and not sufficiently long digestion. You must consult Dr. Eder's book on Emulsions for details; they are too long for these columns.

Q.—F. M. S. writes: Please give us your idea through the BULLETIN of a way to make the lightest and most compact changing bag for plates up to 11 x 14. Also dark room, about 5 feet square; the material to use, etc.; something which can be carried in trunk with other view equipments.

A.—A good large carriage umbrella made of dark thick material (rubber cloth is best) and fitted with an extension curtain with holes for head and arms, makes an excellent changing bag, and if large enough could be utilized as a dark room. Your own ingenuity would furnish the details.

Q.—F. W. M. writes: How long is it necessary for a negative to remain soaking in water? Also prints to remove the hypo? When a negative is soaking do you suppose there could be anything in the water which would make fine holes in the negative? Using the same care East as I have here and dusting the plates before putting them in the holders, I was never bothered with these fine holes. Inclosed you will find one print of a vineyard view. The negative was made on quite a windy day from the top of a large winery at least 60 feet high in the center of a mile square vineyard. The tall trees you see in the distance are at least half a mile away, for the whole vineyard is surrounded by trees. Now what is the matter with this print? And how can I improve upon it? I also inclose one showing the fine spots I speak of, caused by dust or impurities in water.

A.—If you change the water every ten or fifteen minutes, six such changes are usually sufficient to wash a negative or print practically free from hypo. Prints take longer than negatives, but the above is a fair average washing. If you leave a negative in water too long it will blister, and on drying the blisters dry and form small holes; water containing much carbonate of lime will also give the same results. The trouble with the vineyard picture is that it was not taken quick enough.

Q.—L. R. writes: Can you send me (through "What Our Friends Would Like to Know") the number of the BULLETIN referred to in BULLETIN No. 24, volume 17, date December 25, 1886, page 746, by Professor Newbury? I wish to get a copy.

A.—The article referred to is "Notes on Emulsions," BULLETIN No. 7, April 10, 1866, page 196.

Q.—C. H. writes: Will you kindly tell me through your question column the meaning and cause of astigmatism in a lens?

A.—Astigmatism in a lens is horizontal or vertical distortion of straight lines, caused by irregular refraction of the margins of the lens, the image given being elliptical either horizontally or vertically.

Q.—J. R. M. writes: Please answer question as to which is the best way of printing a sectional view on one piece of paper—that is, joining two or more negatives and printing on one piece of paper?

A.—We cannot give in these columns any details with regard to the method of printing that you mention. In the first place, the series of negatives must register with each other—that is, where one ends the other must begin. It is also necessary that they should overlap a little to allow of careful adjustment in the frames, and allow trimming. The frames also should be specially constructed, so that the paper can be exposed in sections under the negatives, and the parts exposed first be protected from the sun, while the succeeding sections are being exposed. In other words, a long frame with closed sections at each end, to cover the parts already exposed and also those that remain to be exposed. These are our ideas about the matter, and each individual has some peculiar method of his own to arrive at the same result.

Q.—T. H. E. writes: 1st. Do photographs turn yellow in a short time from imperfect fixing? 2d. What causes pictures to turn pink on the back in the toning bath or in water immediately after toning? Perhaps only a few out of fifty will show it. No particular bath.

A.—Yes; owing to the decomposition of the silver hyposulphite left in the film undissolved by the hypo; this turns yellow in sunlight, and if much is present may become brown. We do not understand the second question; send us a specimen.

Q.—R. S. B. writes: On page 267, April 19, 1889, in *The British Journal of Photography*, I notice a cut of a centrifugal separating machine made by Watson, Laidlaw & Co., of London. Is there any made in this country?

If so, kindly give me address. All information thereto will assist a silent worker.

A.—We do not know of such a machine made in this country. Write to the English makers, care of *British Journal of Photography*, 2 York street, Covent Garden, London, and inclose note saying where you saw the machine noticed.

Views Caught with the Drop Shutter.

PARSONS & BATES, photographers, Iowa Falls, Iowa, recently sent us their subscription for the BULLETIN. This firm consists of two young ladies who own the studio, which is remarkable for its neat and pretty arrangement. We cannot help congratulating these young ladies for their enterprise, and also for their good taste in selecting the BULLETIN as a helpmate. From all the good things we hear of them, there is every prospect of their venture being a success, and we wish them Godspeed.

As we go to press we regret to hear of the death of Mr. JOSEPH FOX, of the firm of J. W. Queen & Co., Philadelphia. Mr. Fox was manager of the photographic department of the firm, and one of the editors of the *Science of Photography*, which was discontinued owing to his recent illness. We extend to his bereaved father and family our sincere sympathy.

MARRIED.—On June 23d, at the residence of the bride's parents, Nashville, Tenn., Rachel Goldstein to A. Hazin (with R. Broude & Co.), Pittsburgh, Pa. We congratulate the happy

couple, and wish them all the joy life can afford.

L. M. PRINCE & BRO., Cincinnati, O., have just issued a new catalogue of 200 large octavo pages, handsomely illustrated, and containing all the latest novelties.

E. & H. T. ANTHONY & Co.'s new catalogue for amateurs is an excellent compilation, containing 120 large octavo pages, handsomely printed and illustrated, and full of all the latest amateur apparatus.

MULLETT BROS., Kansas City, Latest Catalogue, No. 10, Quarto, Illustrated, just at hand. 176 pages of solid matter, illustrations, etc., of all goods pertaining to photography. What the professional or amateur photographer cannot find illustrated, fully described and priced in this catalogue we are led to believe he can get along without. We notice that the well known apparatus of our publishers is fully illustrated, including such new things as the Victor Cameras and Equipments, the Front Focus Novelette Cameras, the "Normandie," and others.

AND now comes another illustrated catalogue, No. 11, from J. C. SOMERVILLE, St. Louis, his last and best effort in the catalogue line. 191 pages, full to the brim of illustrations, prices, reading matter, etc., of interest to any and all photographers. This will, no doubt, largely increase the already extensive trade of Mr. Somerville, and be of general benefit to the photographers of the Southwest. We notice that all the leading apparatus of our publishers is well represented.

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THE RUINS AT JOHNSTOWN, PA.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

JULY 27, 1889.

Vol. XX.—No. 14.

WHAT KNOWLEDGE IS OF MOST WORTH TO THE PHOTOGRAPHER?

In propounding the above question, we know we are liable to encounter considerable difference of opinion, and at the same time we fully realize the large scope that the answer must necessarily cover. Nevertheless, there are certain particular sections of human knowledge that we believe are more or less indispensable to the success of the photographer, both as an artist and as a handicraftsman.

We will assume that we have a young man that has had a common school education, and he is seeking to so plan his life that he shall fit himself to be a good photographic artist. He has only a limited amount of capital at his disposal, good health and a clear head. One without any capital, only a home, health and good common sense, would be equally eligible to the course we are about to recommend. With the common school education we have supposed such an individual to possess, he will be entirely competent to take up the more elementary studies of a higher education. And one of the first things to set about learning is a knowledge of mathematics, beyond arithmetic; this embraces elementary algebra and geometry, in order to understand the value of proportions and equations, and the measurement of angles. At the very suggestion of such a course we can hear some of the older members of the fraternity crying aloud: "Oh, that's all nonsense; what's that to do with making pictures?" In the beginning, why should a boy or girl learn geography and grammar? They have nothing to do with making pictures; but they do have a great importance in the development of the mind. In the same manner the appreciation of the value of proportion and the measurement of angles will save a man from making many a stupid blunder in perspective that without such knowledge he will not realize. And independently of all this it will help him to understand better some other pieces of knowledge that we are about to suggest as valuable to the photographer.

Having attained a reasonably accurate knowledge of elementary mathematics, the next step should be the acquisition of a knowledge of physics, especially optics. In suggesting this step, we are satisfied that thousands of dollars would

be saved for many of our photographers, if they only knew some of the most elementary facts in physical science. The effect of heat and light on glass and metal, the effect of refractive substances upon light, the optical properties of lenses; why, the very enumeration of these topics must suggest their value to the photographer. Yet there are many that will say, "Oh, you are becoming too scientific." What does "scientific" mean? Is the photographer to be careless? Scientific means careful. Is the photographer to be inaccurate? Scientific means accurate. Can the photographer understand his camera and lens without a knowledge of the optical principles that they are constructed upon? Would a mere intuition tell a man that a double convex lens would give an inverted image on the ground glass; and that the light that passes through a diaphragm is proportional to the area of the opening? No one that thinks about the subject would attempt to deny that all these things are facts that come from observation and that such observation must be accurate to be of value; in other words, it must be scientific. In order to understand physics, it is essential that some knowledge of mathematics (as we have mentioned above) should first be acquired.

Having mastered as much science as will give the requisite knowledge to understand the camera and lens, which is physical science, we should then recommend a study of chemistry. This, perhaps, is even more important than the former studies, heat and light, that we have mentioned, and we have found, as the result of many years of instruction, that chemistry is also not readily understood without a knowledge of mathematics.

In the study of chemical science, we would caution the beginner against taking short cuts to learn "photographic" chemistry. There is really no true photographic chemistry, but photographic processes are chemical processes; and are becoming more and more dependent upon an accurate knowledge of the science. It was an easy matter to coat a plate with collodion and develop with sulphate of iron in former days; but to-day we have a host of new chemical compounds being presented to us as developers, we have another line of substances as color sensitizers, giving orthochromatic plates; all of which involve a good knowledge of chemical science to use them and appreciate them properly. It is above all things important to have a good knowledge of chemistry.

We therefore think that among many other pieces of useful knowledge for the photographer, mathematics, physics and chemistry are pre-eminently fitted to stand first on the list. With a knowledge of mathematics, the mind appreciates perspective and proportion in form much better than without it. With a knowledge of physics all those phenomena of sound, heat, light and electricity, with which we are daily becoming more and more surrounded, no longer remain objects of bewilderment; but each is understood and appreciated. Many of them being intimately connected with the photographic art.

Like all other arts and professions, the mere acquisition of the knowledge we have indicated will not make a man a good photographer. He must have a sufficiently clear head to apply the knowledge acquired, and at the right time. Again, he must be an artist, and by this we mean that he must appreciate and note those combinations of form and color that make the pictures we see and that please us. Much of this knowledge can be acquired by reading; but by far the larger and more valuable portion of it comes from careful observation—

in other words, it is truly scientific. It is the acquiring of a knowledge of those combinations that please or distress the eye in nature, and the storing of them in the mind for future use. The just appreciation of these forms and the union of them into compositions gives us the artist.

Much, very much, more could be said upon the subject of useful photographic knowledge; but if the thoughts given above serve as a guide to some just starting in the profession, we shall be glad that they were penned. Our advice is founded on many years of observation in educating young men, and the line of work indicated above will save from many pitfalls in the future. It will be a foundation upon which a superstructure of more imposing proportions may safely be reared. As to where to obtain such knowledge, we have only to point to the many excellent scientific schools covering the length and breadth of the United States, where over every door is written "Come and Welcome." And almost without cost to the seeker after wisdom, owing to the generosity of many great and good men. There is no excuse for ignorance in the rising generations.

EDITORIAL NOTES.

A STORY comes from Mexico that by a combination of electricity and photography, a reproduction of human speech at a distance is possible. The method consists in first speaking into the receiver of a photophone, Graham-Bell's invention for turning light into sound. The highly polished diaphragm is set into vibrations, and a beam of light falling upon it allows these vibrations to be photographed upon a band of sensitized paper. An image of these photographic impressions is now projected by the electric light upon a selenium receiver, and when the images follow one another at the proper rate the original speech is heard. The idea seems possible, but the story requires confirmation.

WE are indebted to W. S. Emens, of Shanghai, China, for a copy of the rules of the "China Camera Club." Ying-siang-way is the motto on the cover, which we suppose means the same thing. Dr. W. J. Milles is the *President*; W. G. Gibson, *Secretary*; and W. S. Emens, *Treasurer*. Any resident of China, not a professional photographer, is eligible for membership. Meetings are held once a month, from September to May, inclusive. The Club offers prizes to its members for competition, and holds an annual exhibition.

FROM Professor W. K. Burton we have just received notice of the organization of the Photographic Society of Japan. Viscount Enomoto, Minister of Education for Japan, is *President*; the *Vice-Presidents* are Professor D. Kikuchi, Director of the College of Science, and Dr. W. S. Bigelow; the *Secretaries* are Professors H. Ishikawa and W. K. Burton. The membership numbers about sixty, one-half of which is Japanese; and the majority of the members are amateurs, with a few professional photographers. The first meeting was held June 7th at the Chamber of Commerce (Shokokai), in Kobikicho (east side of Central Telegraph Office), Tokio, and on another page will be found a report of the proceedings. This is another of the good things Professor Burton has done for photography during his stay in Japan, and we congratulate him.

A STRANGE story comes from San Francisco. A certain Professor Richard D. Willoughby, of Alaska, claims to have photographed a mirage. Two prints have been sent to the United States Government at Washington and the third was sent to the *San Francisco Chronicle*. These are 8 x 10 inches in size, and represent a scene taken from a garden or park on a hill. In the foreground are a graveled walk, a stone wall, rustic seat, and a child at play. Beyond the wall are house-tops and some clumps of trees. In the distance are incomplete towers of a cathedral and several tall buildings, while in the far distance and enveloped in clouds are tall smoke-stacks and church towers. The architecture is said to be modern, and the chimneys are made of tiles. At Tabor's studio, in San Francisco, the picture is regarded as a trick, the result of a badly exposed plate. Perhaps we shall hear more about this picture in the future.

THE amateur photographers of Wilmington, Del., have organized a club of thirty members, with Colonel Christian Febiger, *President*; J. Robinson Moore, *Treasurer*; and John H. Danby, *Secretary*. The Club meets the first Saturday evening of each month; annual meeting in January.

WE call special attention to the letter of *Secretary* Scott about railroad fares to the Boston Convention. Careful attention to this matter will save a great deal of trouble to all who attend the semi-centennial of photography. It is unnecessary to give the officers of the Association extra trouble in this direction; they can use their time much more profitably on matters pertaining to the Convention.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Yellow Fog on Dry Plates.—Alum and Acid in the Hypo Bath.—Old Things Published as Something New.—Schroeder's New Lens.—Eikonogen, the New Developer.

A VOLUME could be written about fog on dry plates, and when finished one might commence anew, new observations about fog being made every day.

Thus I obtained recently a remarkable yellow fog in a lot of dry plates from a manufacturer, who has supplied me with this article to my satisfaction for six years. It appeared particularly in plates of short exposure and weak developer. A closer examination proved that this yellow deposit could be washed off after fixing, being nothing but metallic silver. This appearance is not new to me, having made the observation about yellow metallic silver about twenty-five years ago, while occupied with resilvering a mirror. If a very thin deposit of silver is put upon the glass plates it will have a transparent yellow tint, and this changes to blue with a heavier deposit. Such a reflecting deposit will now form readily in the presence of ammonia. This dissolves a small quantity of bromide of silver, which, reduced by the developer, separates with yellow reflection. This takes place particularly with a developer which has been used quite often and develops slowly. With a quick developer it does not appear, the images being developed before the ammonia has time to dissolve the bromide of silver. It is fortunate that this kind of fog can be removed easily, a slight rubbing of the moist gelatine film with the finger being sufficient.

It was a good while ago that the addition of alum to the hypo bath was recommended ; but objection was always made that sulphur separates by the decomposition of the bath, which might be detrimental to the negative. Against that is recommended by Kleffel an acidified fixing bath with alum to prevent the formation of brown deposits upon the plate, which is said to take place from hydroquinone. Herr Lainer recommends at present a fixing bath which contains a mixture per liter of 70 to 100 c.c. sulphite of soda solution, with 30 c.c. of tartaric acid solution (15 grm. dissolved in 30 c.c. of water), or 40 c.c. citric acid solution (20 grm. dissolved in 40 c.c. of water).

Lainer says that this bath proves generally advantageous after all alkaline developers, which are subject to becoming brown.

With regard to the production of the acid fixing bath, he remarks that the tartaric acid or citric acid solution has to be mixed with the sulphite solution before it is added to the fixing bath.

Lainer made the observation that the acid fixing bath has a hardening action upon the gelatine films. Comparing a plate fixed in a neutral bath with one fixed in an acid fixing bath, he proved that in the latter case the gelatine film has more power of resistance against rubbing with the finger than in the first case, and that the film had a less slippery appearance.

To further confirm the observation Lainer cut from some gelatine sheets two equally large geometrical figures, both in a length of 55 mm. After soaking in ordinary water an increase in size of 2 mm. took place. Lainer placed now one sheet in an ordinary neutral fixing bath; the other he placed in the fixing bath acidified with double the quantity of the citric acid sulphite mixture. After about ten minutes it showed that by application of the acid fixing bath the figure had resumed its original dimensions, a length contraction of 2 mm. having taken place, while in the neutral fixing bath the extension was only moderate. The thickness of the films differed now also considerably, the acid fixing bath having made the sheet thinner and tougher.

The acid fixing bath acts, therefore, not only advantageously with regard to the clearing of the negatives, but in consequence of its contracting effect also favorably upon the power of resistance of the film and the adhesion of its support, and perhaps also with regard to the prevention of distortions.

No matter how zealous the work is at present for the progress of photography, there is no want of old things being raked up and announced as new inventions. The younger members of the brotherhood do not observe this so easily, but the older ones notice it. Thus I read lately: Again something old is announced as the latest novelty. Application of albumen paper as transfer paper in the carbon process. This is already described in Vogel's "Handbook of Photography," third edition, page 48, 1878:

Photographic albumen paper is placed for a short time in alcohol, to make the albumen insoluble, and then it is pressed together with the exposed surface (of the pigment sheet, etc., etc.).

There are a great many people in the photographic line who would like to invent something, but they have not gumption enough to do so. These are in the habit of raking up matters belonging to the past. Thus they bring in proposition again the method, published by Abney one and a half years ago, to produce color sensitive plates by coating ordinary plates with colored collodion

(erythrosin-collodion). Mr. Ives declares this method to be of no value. I called attention last year to the fact that such plates are considerably less sensitive than those colored in the emulsion film; and this is not to be wondered at; the light, before it reaches the bromide of silver, being obliged to first penetrate the collodion film, covering the same and being considerably weakened hereby, particularly those rays which have to act upon the bromide of silver. I had to expose a gelatine plate coated with eosin collodin twenty times longer, to obtain the same effect as on a gelatine plate colored with the same quantity of eosin in the emulsion.

In opposition to the reviving of such old and useless inventions, it is of great interest to be able to report, once in a while, actually new inventions. To these belong Dr. L. Schroeder's new lens. Mr. Schroeder is one of our best opticians, who calculates his objectives thoroughly, and who, with the aid of the new magnificent optical glass from Jena, has obtained a first-class result. The Jena glasses admit the solution of optical problems which formerly were thought to be an impossibility. The lens is a concave meniscus. The concave surface is of equal or smaller radius than the convex one, and the lens deviates thereby from all similar condensing lenses, which are always thicker in the center than on the outside. It is composed of two single lenses, a plano-convex glass lens of a high refractive index and low dispersion, which is fastened to a plano-concave lens of a low refractive index, but of the same, or, better, of a higher dispersion, being fastened together with their plane surfaces. (See Fig. 1.)

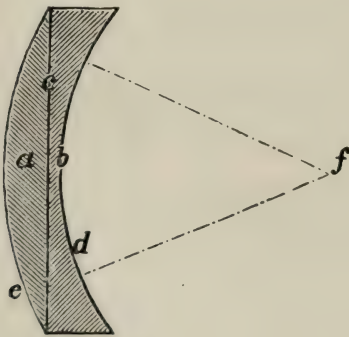


FIG. 1.

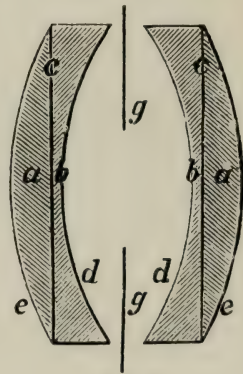


FIG. 2.

This lens can be used either singly, like a landscape objective, or in connection with another of similar construction, in which case it is best to put them close together, with their concave sides facing and a diaphragm between. Thus composed, it is completely free from any distortions and has a great visual field. Such lenses give a thoroughly sharp picture, which is of great advantage with most lenses, particularly for photographic and similar purposes.

Fig. 1 of the accompanying drawing represents the cross-section of an objective made according to above directions; *a* is the plano-convex lens, of high refraction and low dispersion power; *b* is the plano-concave lens of low refraction and the same or higher dispersion power.

Fig. 2 represents a combination, or two such lenses, absolutely free from distortion.

The concave and convex outer surfaces (designated with a and b) are parts of concentric or nearly concentric circles, which have their center in f . The plane inner surfaces should be fastened together (at c).

To obtain an even picture through a wide visual field, the radii of the outer surfaces (e and d) should be in a certain proportion to each other, depending upon the refraction and dispersion power of the glass which is applied.

Schroeder is the manufacturer of celebrated astronomical telescopes, and his latest inventions in the photographic branch can be looked upon with only the greatest interest.

About another novelty—a new developer—I mentioned to you already, before it was in the market. The name given to it is eikonogen. Several samples have been presented, but, as with all new inventions, the results differ in different hands.

Herr Stoll reports in our Society for the Advancement of Photography that he has made very satisfactory tests with the eikonogen, particularly for instantaneous views, and that he obtained always strong negatives by application of the preliminary bath.

Herr Vogel, Jr., remarks that the developer admits a considerable shortening of the exposure, and that for views requiring three seconds' exposure for hydroquinone development, one second was sufficient with the "eikonogen;" but all plates which developed good and quick were too thin, but had become sufficiently good for use after strengthening. Mr. Vogel had applied no preliminary bath, as recommended by Mr. Stoll. The latter remarks that he applied the alum solution, as prescribed, but he experienced that the plates looked completely mealy, and he recognizes this as a precipitate of alumina. The alum bath is not considered to be necessary.

Herr Vogel, Jr., confirms this, with the remark that the eikonogen (being a naphthalin derivative invented by Dr. Witt) will tan the gelatine considerably. The writer believes, also, that this is the cause of the very thin plate, the action of the developer being only superficial after tanning.

The preliminary bath consists of one gramme hypo, two liters well water, and fifteen drops bichloride of mercury solution, 1:100.

The developer formulas are the following :

I. *For ordinary purposes*.—200 grm. sulphite of soda and 150 grm. crystallized soda are dissolved in 4 liters cold distilled water, and 50 grm. eikonogen in dry powder are in addition put into the bottle. This solution is applied directly for developing, without any additional water. With this formula half the time of exposure suffices, in comparison with the oxalate of iron. For still shorter exposures the preliminary bath is applied. For longer exposures dilute with about one-half of the water or add bromide of potassium.

It is not necessary that the crystallized soda should be chemically pure, but it can be such as is used for domestic purposes.

II. *For very short instantaneous views*.—Dissolve 10 grm. sulphite of soda and 5 gr. potassium carbonate in 150 c.c. distilled water, and add 5 grm. eikonogen. Instantaneous pictures can be developed with this, which could not be obtained with any other developer. The potassium carbonate should ordinarily not be used, as it acts too energetically. Ammonia should also be avoided. The distilled water can be replaced by pure rain or soft well water, which has been

purified with sodium carbonate, by addition of 2 to 3 gr. to each liter of water. It should then be left to clear. To obtain the best results it is necessary to use fresh, unadulterated sodium carbonate. But as this salt spoils easily, it is furnished, together with the eikonogen, in well sealed tin cases of a capacity of 200 grms. The sulphite of soda will keep for years in these tin boxes, and they can be opened easily. The price is very low, so as not to obstruct the introduction of the eikonogen by application of high-priced chemicals. The price of 100 grm. eikonogen is three marks.

BERLIN, June, 1889.

LUMINOUS PHOTOGRAPHS.

An ordinary positive proof is rendered luminous in the dark by the following process: Spread as evenly as possible a thin coating of starch paste on a sheet of card-board, and when still tacky dust over it powdered calcium or barium sulphide, rubbing with a brush in order to make it adhere everywhere. On the other hand, imbue a positive proof—printed rather light, toned and fixed as usual—with castor oil, and rub off the excess with a clean rag. This done, paste the transparent proof on the prepared card-board and dry the whole before the fire.

When the proof thus backed is exposed to light, the rays are transmitted through it to the sulphide which absorbs them, and afterwards radiates them again as light, it being phosphorescent. The proof will be, therefore, luminous in the dark, and that without much alteration in its general appearance, since the light is necessarily transmitted in proportion to the various intensity of the tints forming the image, the whites being very phosphorescent, while the darks emit but little light.

The effect is strange; try it.

P. C. D.

[From *Photographische Mittheilungen*.]

THE PYROCATECHIN DEVELOPER.

BY DR. CARL ARNOLD, *Hanover*.

THE hope expressed by me some time ago that the price of pyrocatechin would be lowered as soon as the same could be produced in large quantities, seems not to be realized, according to communications received from Dr. Schuchardt, in Görlitz. That gentleman, at my request, was kind enough to have made for me at his factory a so-called technical—that is, not chemically pure—preparation, which, in the beginning, was of almost equal action with the pure preparation when tested by me; but even that cannot be made for less than eight-tenths mark per gramme. Further tests showed that at a price difference of only 20 per cent., the completely pure preparation should by all means be given the preference, as the latter, in aqueous solution, is, after eight weeks, still of the same action as on the first day, while the impure article, in consequence of the foreign matter mixed with it in aqueous solution, loses from day to day in reducing capacity. While giving the reducing capacity of the pyrocatechin in comparison with hydroquinone previously as 15:1, it has now been proven that the reducing capacity is so enormously great that the price of one mark (per gramm) can hardly come into consideration, as from 100 to 150

plates, of 13 x 18 cm. size, can be developed with this quantity. The quantity of the carbonate of potassium can be considerably reduced, if one possesses the necessary patience in developing, which for a good many of the dry plates, that frill easily in a solution containing 5 per cent. of potassium carbonate, is of great importance. Sodium carbonate may also be used in place of potassium, but the negatives produced with this are never of equal sharpness and the development is much slower. It surprises me that most of the hydroquinone and pyrogallol acid developers contain from 8 to 10 per cent. potassium carbonate, and that no complaint is made that those developers frill the plates. If such quantities of potassium are applied with the pyrocatechin, or even more caustic potassium solution is added, very shortly exposed plates can be developed with it; but with the exception of the films (Vergara and celluloid plates) I have had no brand of plate in hand yet that would not frill, or the whole film peel off.

The new developer is, for these reasons, not to be recommended for plates of short exposure, but an accelerating preliminary bath might be found pretty soon. An addition of sulphite of soda has no influence on durability, etc., with either the technical or pure pyrocatechin, and it even seems to exercise a retarding influence.

For developing I keep on hand: first, a 1 per cent. solution of pyrocatechin; second, a 20 per cent. solution of carbonate of potassium. Both solutions will keep in the light. From this apply for well exposed plates of 18 x 24 cm. size, 1 c.c. or 16 drops of the first, 5 to 10 c.c. of the second, and 60 to 80 c.c. ordinary water.

For instantaneous views, the addition of the first solution can be increased to 5 c.c.; but this is of more subordinate significance than the increase of the second solution, of which in this case 15 to 20 c.c. are to be applied. By a gradual addition of these two solutions the development of the picture can, of course, be accelerated or the lights increased.

After the experiences with the new developer made by me up to the present day, I believe that I can predict a great future for the same, and would advise every one to test it. But so far I can only guarantee the pure pyrocatechin from the factory of Dr. Th. Schuchardt, in Görlitz. The properties of the new developer may be shown in the following:

1. The pictures possess an excellently copying gray tone, and do hardly go back during fixing.
2. Formation of fog has never taken place during my experiments.
3. As soon as the negative is in the developer it loses its sensitiveness to light almost completely. I develop, therefore, in gas, kerosene or candle light, at about $\frac{1}{2}$ meter distance; yes, even in diffused daylight development can be continued without any visible influence.
4. Even at 5 to 6° C. of temperature a slower development cannot be observed.
5. Whether two or thirty seconds' exposure, remains without influence as to the result; the development proceeded always gradually.
6. The developer leaves no spots on the hands.
7. The price, in consideration of the extremely small quantities used, is comparatively much cheaper than that of other developers.
8. The simple composition of the developing liquids, the easy solubility of

its component parts in water, and therefore the possibility of producing highly concentrated solutions and to measure these from drop glasses.

9. The convenience of carrying only condensed quantities of the ingredients during traveling ; 5 grm. pyrocatechin and 1 kilo potassium carbonate are sufficient for more than five hundred developments. Total expense, six marks ; therefore for one plate 13 x 18 cm., 1.2 pfennig.

10. The developer should only be used once, the necessary additions to old developer being sufficient for the preparation of a new quantity.

11. The development can proceed without motion. The more the developer is set in motion the more rapid the development will take place.

12. Serviceable pyrocatechin forms pure white, scaly crystals, which should dissolve colorless in water. By dropping the solution upon the liquid containing the potassium carbonate, a handsome green color will appear, disappearing again when the liquids are mixed. The aqueous solution, when kept, should only color very weakly yellow. Mixed developer will not keep.

DEPTH OF FOCUS.

BY CONRAD BECK.

[Read before Camera Club Conference.]

(Continued.)

Now we come to the second great factor—the diminishing power of the lens, which, for distant views, depends on the focus. I have said that the focus of the lens does not affect the focal interval, which I define as the allowable interval between the picture planes, such that all pictures formed by the lens in this interval will be sharp on the photographic plate placed in the center of this interval. No, it does not ; the focal aperture alone affects it. But, according to the focus of the lens in use, so this focal interval will represent a greater or less interval between the objects whose pictures are included in it. That is to say, if we find that an aperture of $\frac{f}{16}$ were to give a focal interval of $\frac{1}{2}$ inch,

with a very short focus lens we might find that the pictures of all objects between the distances of 3 and 300 feet were included within this $\frac{1}{2}$ -inch interval, whereas, with a longer focus lens, the $\frac{1}{2}$ inch might only include the pictures of objects from 200 to 300 feet away from the lens. On investigating this matter, we shall find that it all depends on the diminishing power of the lens. With every lens it is possible to place our object in such a position that the picture formed is the same size as the object, and when this is the case—when there is no diminishing power—then the depth of the focus is always the same, and depends solely on the *focal interval*. Thus, for taking life-size portraits, no matter what is the focus of the lens used, the depth of focus cannot be altered by any means except by stopping the lens down (of course assuming the lens to be free from aberration, which, with good portrait lenses, is generally the case).

For distant objects the diminishing power of a lens depends purely on its focus ; the shorter the focus the lens has, the more it will diminish, or the smaller the picture it will give, so that, in this case, the depth of focus will depend on the focus. Now, we shall find that the amount of difference in the objects which the focal interval represents depends on the square of the diminish-

ing power, or, for distant views, on the square of the focus. The exact formula is as follows :

$$\frac{x}{x'} = \left(\frac{y}{y'}\right)^2$$

x = focal interval.

y' = size of object.

x' = distance between objects whose pictures are included in the focal interval.

y = size of its picture.

Or, to carry on our previous piece of work. To find the nearest object that will be sharp when distant objects are also sharp, all we shall have to do is to find what is the distance from the optical center of the lens of the object that has its picture at a distance of $f + \gamma$ (the focus of the lens plus the focal interval).

The conjugate focus of $f + \gamma$ is $\frac{f^2}{\gamma} + f$.

Thus in example above let—

$$b = f = 8$$

$$a = 2$$

$$c = .005$$

$$v = 4$$

$$\gamma = .04$$

$$\frac{64}{.04} + 8 = \text{say, } 44 \text{ yards.}$$

That is to say, if our photographic plate be in the center of our focal interval, all objects from the horizon to a distance of 44 yards from the camera will be sharp enough to give a good photograph.

To sum this up. There is a certain allowable interval between our picture planes, which I have called the focal interval, dependent on the stop used, and all objects that have their pictures included in this interval will be sharp in the photograph. And the range of objects that have their pictures included in this interval depends on the diminishing power of the lens. Or, put into definite terms, reducing the focal aperture of the lens one-half doubles the depth, and doubling the diminishing power of a lens increases the depth four times. For distant views, where the diminishing power depends on the focus, reducing the focus of a lens one-half increases the depth four times. For life-size or nearly life-size pictures, the depth is only increased by cutting down the aperture of the lens.

Now we come to the consideration of the part that aberration plays in the question of depth of focus, depth of definition, diffusion of focus, confusion of focus, or whatever you may prefer to call it.

Let us take one of our candles, and observe the image of it formed on our screen through this large lens, which has a very large amount of aberration. We shall find that at no position can we obtain a perfectly sharp picture of our candle, but that we get a fairly sharp image at any point in a small interval of space. Now, if this lens were a perfectly corrected lens, we should find that when we were moving our screen backwards and forwards to obtain the best picture, it would all of a sudden drop into a position where a sharp picture was formed like a

bullet into a hole, and the least alteration of position one way or the other would not give a sharp image. We lose in the brilliancy of our picture by having a lens with aberration, but we gain in range—that is to say, we increase our focal interval. For taking large portraits, when depth of focus is of more importance than brilliancy of definition, it is advantageous to leave a large amount of aberration in our lens, but such a lens is useless for any other purpose, unless it has a means of varying the aberration, such as that possessed by Mr. Dallmeyer's portrait lens.

I consider that for lenses to be used for all-round work, with an aperture of $\frac{f}{4}$ or $\frac{f}{6}$ the aberration must be very carefully corrected; but when the full aperture of a lens is $\frac{f}{8}$ or under, provided the lens is of fairly short focus, a certain amount of aberration is an advantage, as it does not materially impair the definition, owing to the large diminishing power of the lens, and it does largely increase the depth of focus of the lens. There are, therefore, in the consideration of this subject three factors:

1. The focal aperture of the lens upon which the focal interval depends.
2. The focus of the lens on which depends the range of objects which are included in this focal interval, and which will therefore be sharp and in the photograph.
3. The amount of aberration which the individual lens possesses, and this must be left to the skill of the manufacturer in making his corrections, so as to produce the lens best suited for the purpose for which it is intended.

Now let us take a practical example of how these facts apply to a particular case. Suppose we require a lens of, say, 6 or 7 inch focus for a detective camera. Let us consider three lenses of the same focus, all of which we will assume, for the sake of argument, will cover the plate equally well, one with aperture $\frac{f}{4}$ one with aperture $\frac{f}{5.6}$ one with aperture $\frac{f}{8}$ which would be best to select? The lenses with apertures of $\frac{f}{4}$ and $\frac{f}{5.6}$ it will be found, in order to give sharp pictures, must have their aberrations very accurately corrected; the lens with aperture of $\frac{f}{8}$ may have a quite considerable amount of error purposely left in the correction for aberration. Let us suppose then that with these three lenses such is the case. The first obvious choice would be the $\frac{f}{4}$ lens, because the additional rapidity might be sometimes useful, or at any rate the $\frac{f}{5.6}$ lens. Now I think all who have used detective cameras much will agree that with a lens of focus 6 or 7 inches and an aperture $\frac{f}{4}$ a picture can never be obtained worth having, because of the small amount of depth the lens possesses, and that with $\frac{f}{5.6}$ not more than once in twenty times can a picture be taken which is

satisfactory for the same reason. That is to say, the apertures $\frac{f}{4}$ and $\frac{f}{5.6}$ can very seldom be used for detective shots. But, we might say, stop all three lenses down to $\frac{f}{8}$ and they will work equally well, and we have the advantage of our rapidity for special work, if we require it. No doubt; but the fact that, in a lens with full aperture $\frac{f}{8}$ there can be a quite considerable amount of uncorrected aberration left without its impairing the definition, will insure that this lens has considerably greater depth of focus than either of the others when used at the same aperture $\frac{f}{8}$. Now, for my own part, I find that a large number of figures and instantaneous pictures can be taken at $\frac{f}{8}$ which give, with a lens such as described, enough depth to make a good photograph; but that, unless the lens has a very short focus, this is about the largest aperture that can be used. For these reasons I should, therefore, say that a detective camera, with a lens of 6 or 7 inch focus, should not have a larger aperture than $\frac{f}{8}$.

This is, of course, only one of the obvious instances in which the question of depth of focus affects practical work, and I will not further occupy your time by enumerating any of the other interesting points connected with the same.

DISCUSSION.

Mr. DALLMEYER said that he quite agreed with Mr. Beck's remarks, except on one point. It was an undoubted fact that the introduction of positive spherical aberration, while not improving the image on this side of the true focus, vastly improved it on the other side, and thus gave equal definition over a much greater depth. But, at the same time, he could not allow the introduction of any aberration in lenses to be used on detective cameras, as the picture obtained by these had frequently to be enlarged, and then any indistinctness would soon show.

Mr. TRAILL TAYLOR said that he was certainly most strongly in favor of lenses that had no really sharp focus. He remembered, many years ago, a lens that was made by Mr. Dallmeyer, at the special request of Mr. H. P. Robinson and other gentlemen. It was a triplet, but the central combination was much larger than usual. This lens was introduced at a meeting of the British Association, and was not received with favor by the then President, the Rev. Charles Pritchard. This lens had no focus at all at full aperture, but by stopping down the spherical aberration was cured, and the lens would define a single plane sharply. For large heads such a lens was invaluable, for it rendered the picture by soft lines, as if made with a soft crayon, and not sharp ones like the strokes of a pen.

Mr. H. P. ROBINSON said he never had, and did not think he ever would, understand the $x + fs$ that garnished the blackboard; but he certainly believed in a certain amount of softness, which ought to be introducible at will, but at the same time he strongly condemned the present movement, which appeared to be in favor of doing away with all focus altogether.

Captain ABNEY said that many interesting points with regard to depth of focus had been passed by; to begin with one, for example. Mr. Beck had assumed that the image of a point was always a point, but this had to be taken *cum grano salis*; for instance, if one measured the size of an image of a star given with a lens of $7\frac{1}{2}$ inches, working at $f/15$, it would be found to be $\frac{5}{1000}$ inch; if the lens were stopped down to $f/64$ it would be $\frac{1}{500}$ inch; if the focus of the lens be increased to 30 inches, you will find the size of the star to be $\frac{1}{100}$ inch, so that it

was very necessary to take into the account both the focus and the focal aperture before fixing a minimum size for a point, as the more one diminished the aperture, the larger would be the size of the point, owing to this diffraction intervening; this would account for the fact that in some enlargements one could not get sharp pictures, do what one would. As a scientific photographer, he did not agree with Mr. Robinson. He wanted a lens that would give him a representation of a spectrum ultimately sharp, and he thought that this pointed to the fact that opticians should produce lenses to suit all kinds of customers.

Mr. BECK remarked with reference to Captain Abney's instances of diffraction that he had recently learned from an eminent photo-microscopist that he had found practically that the more he stopped down the worse was the definition of his lens.

SCIENCE AND ART.

BY DR. P. H. EMERSON.

[Read before Camera Club Conference.]

(*Continued.*)

III.

NEXT, I shall discuss briefly the ill effects of a too sedulous study of Science upon an Art student.

The first, and, perhaps, the greatest of these ill effects, is the positive mental attitude that Science fosters. A scientist is only concerned with stating a fact clearly and simply; he must tell the truth, and the whole truth. Now, a scientific study of photography, if pushed too far, leads, as a rule, to that state of mind which delights in a wealth of clearly cut detail. The scientific photographer wishes to see the veins in a lily leaf and the scales on a butterfly's wing. He looks, in fact, so closely, so microscopically, at the butterfly's scales, that he never sees the poetry of the life of the butterfly itself, as with buoyant wings it disappears in marriage flight over the lush grass and cuckoo flowers of May.

I feel sure that this general delight in detail, brilliant, sun-shiny effects, glossy prints, etc., is chiefly due to the evolution of photography. These tastes have been developed with the art, from the silver plate of Daguerre to the double-albumenized paper of to-day. But, as the art develops, we find the love for gloss and detail giving way before platinotype prints and photo-etchings.

The second great artistic evil engendered by Science is the careless manner in which things are expressed. The scientist seeks for truth, and is often indifferent to the manner of expression. To him, "Can you not wait upon the lunatic?" is, as the late Matthew Arnold said, as good as, "Canst thou not minister to a mind diseased?" To the literary artist, on the other hand, these sentences are as the poles asunder—the one in bald truth, the other literature. They both mean the same thing; yet what æsthetic pleasure we get from the one, and what a dull fact is, "Can you not wait upon the lunatic?" There are photographs and photographs; the one giving as much pleasure as the literary sentence, the other being as dull as the matter-of-fact question. The student with understanding will see the fundamental and vital distinction between Science and Art as shown even in these two short sentences.

And now, ladies and gentlemen, I do not think I can do better than finish this section by quoting another passage from the writings of the late Matthew Arnold.

“*Deficit una mihi symmetria prisca.*—‘The antique symmetry was the one thing wanting to me,’ said Leonardo da Vinci, and he was an Italian. I will not presume to speak for the American, but I am sure that, in the Englishman, the want of this admirable symmetry of the Greeks is a thousand times more great and crying than in any Italian. The results of the want show themselves most glaringly, perhaps, in our architecture, but they show themselves also in our art. Fit details strictly combined, in view of a large general result nobly conceived; that is just the beautiful *symmetria prisca* of the Greeks, and it is just where we English fail, where all our art fails. Striking ideas we have, and well executed details we have; but that high symmetry which, with satisfying, delightful effect, contains them, we seldom or never have. The glorious beauty of the Acropolis at Athens did not arise from single fine things stuck about on that hill, a statue here, a gateway there. No; it arose from all things being perfectly combined for a supreme total effect.”

CONCLUSION.

And now I must finish my remarks. I have not, perhaps, told you very much, but if I have succeeded in impressing upon beginners and some others the vital and fundamental distinction between Science and Art, something will have been achieved. And if those students who find anything suggestive in my paper are by it led to look upon photography in future with a new mental attitude, something more important still will have been attained. For, in my humble opinion, though it is apparently but a little thing I have to tell, still its effect may be vital and far reaching for many an honest worker, and if I have helped a few such my labor will have been richly rewarded indeed.

DISCUSSION.

Major Nott said that he must begin by stating frankly that there were a great many points on which he differed from Mr. Brett. Prior to the present century artists had had pretty well their own way, and as a consequence in many points they entirely failed in the duties that were asked of them. He would draw attention to one point especially, and that was the illustrating of books, such as works of travel and natural history, where accuracy was the one feature required. Who could find in old works anything like truthful representations of the scenes referred to in the text? Works of art they might have produced, but faithful accuracy had been entirely neglected. It was here that photography had wrought marvels. Regarding the representation of animals, an especial study of his own, nothing could be falser than the conventional attitudes in which the older, and even some of the modern artists, delighted to portray animals in their pictures, which bore no more true relation to the real beast than did the gaudy advertisements of a menagerie to the seedy-looking, harmless denizens inside. He maintained that this blind sacrificing of truth to the dogmas of art, for the sake of making a picture, had done incredible harm. Amongst others, children were taught to hate these fearful-looking creatures, and their innate cruelty to beasts had thus been fostered. He totally disagreed with this attempt to force photography to enter into competition with art, for young beginners would be inclined to abandon their cameras in despair when they found that all their productions were gauged by such an arbitrary standard. He thought that photography had its own distinct aims, which, if rightly followed, would give greater delight to the many than any artist could. Dr. Emerson could only imagine a butterfly as an adjunct to a landscape, and would, therefore, represent it more or less blurred to convey the idea of motion. Can this gentleman not understand that there are a large class of people who would sooner admire the wonderful beauties of the butterfly for its own merits? An artist can produce a very pleasing landscape, but no genius with his brush can depict the butterfly strictly accurately. This gentleman had also reproached photographs with the fact that they were dumb,

that they had to be labeled to tell a story. He distinctly challenged the point. A photograph of Westminster Abbey needed no label to identify it, to those who knew it, but a picture of it would depend for its accuracy on the particular whims and fancy of the artist. In conclusion, he thought that photography could work out its own destiny, and create an art of its own without competing with the works of artists.

Mr. Balfour welcomed Mr. Brett's paper as more sympathetic and appreciative criticism than was generally vouchsafed by painters to photography. At the same time, he thought that even Mr. Brett had hardly realized the extraordinary latitude secured by photographers, through judicious use of lighting, exposure and development. Photography had seldom, as yet, been pursued by men of great artistic gifts, with means and leisure to follow their own bent; but when some artist had devoted four or five years' incessant labor to this work, great results might be expected. As for the ugliness of portraits, the best pictures of at least half a dozen of the greatest men of the age were photographs. Some of the improvement in artists' drawing might surely be attributed to the education of photographers. Mr. Brett had mentioned Mr. Muybridge's photographs as gain to art; but surely he would not introduce animals in any of those topsy-turvy attitudes in his works. A compromise such as Mr. Gow employed seemed best—to represent nothing really untrue, but only those instantaneous positions which did not seem incongruous.

Mr. Balfour greatly regretted the absence of Dr. Emerson, who was not there to defend his own position. It was hard to discuss the generalities of his paper without venturing into the turgid pool of metaphysics, and it was hard to discuss the paper apart from Dr. Emerson's new book. He so heartily agreed with most of the book, as far as it related to photography, that he deplored having to differ in his view of art. Dr. Emerson did injustice to the memory of the artist, and would allow no combination or omission. Art for art's sake limited the application of man's powers and the use of his education. There was one advantage of photography which Dr. Emerson had not touched on, and that was the resemblance of photography to modern painting in this, that art was no longer linear, but worked by masses and contours; it was no longer the art of Raphael, but of Valasquez, and this building up and not scratching was also the method of photography.

The Chairman said that there were many points on which he disagreed with Mr. Brett, and notably his statement that photography misinterpreted nature, and made mountains into molehills. This was merely a matter of the lens used, and he thought it ought not to be allowed to go forth to the world that this was so. As a matter of fact, photography was very accurate, and put a good many pictures to the blush. He could think of many pictures, where, if the height of the mountains were scaled from the size of the moon, they would work out about two hundred miles high. He considered, too, that Mr. Brett was very hard on portraits, and had hoped Mr. Robiison would have tackled him on the subject. A point he thought was frequently ignored was the true rendering of color in monochrome; it might be fluked, but required a long education to perfect one. He quite agreed with the reproach of over-production. With regard to representing the attitudes of animals, photography doubtless had done much in educating artists, but it was, of course, incorrect to represent animals in attitudes that no eye could ever see, the motion being too rapid.

Mr. Brett, in replying, said that he had expected to be very much more mauled than he had been, and on the whole he thought that after a careful perusal of his paper it would be found that he agreed with his critics. He perfectly and frankly admitted all the good that photography had done for artists, and could assure the meeting that had he not held photographers in the highest admiration and respect, he should not have been there that day to read his paper.

After a vote of thanks, the Chairman called on Mr. Clark to read his paper.

The "Summer Annual" has already taken a creditable place in the photographic literature of the time.—*Photographic News*.

Among the contributors are some of the best known names in photographic circles. The volume shows improvement over the first issue of the "International Annual."—*Photographic Times*.

THE LIMITS OF PHOTO-GRAVURE.

BY A. DAWSON.

[Read before Camera Club Conference.]

(Continued.)

THE great want of my own bronze-grained plates was that you could not see defects in the plate for some reason, and therefore you could not tell where and how to work on them. I therefore hit on a mode of making a plain autotype mold on a plate, and having no grain at all. This mold or picture was then made sensitive to light again by bichromate of ammonium, and, as soon as dry, it was bronzed all over and exposed to light for fifteen minutes. After the bronze was washed off with benzole it was put into warm water and the new grain swelled up nicely. I worked this method until I felt the want of true power in it, for it was too fine and velvety at all times, and, for reasons I could not regulate, the grain would vary considerably. But the idea of working from a swelled mold caused me to try molds of plain sensitized gelatine poured very thin and level on a plate glass, and, after printing them with a toned negative, to print again with bronzed powder on the front; this added a grain just as Pretch got a grain by chemical means. I was pleased with the result, and went on with it until I found that it could not be made to produce nice flesh tints. It had the much-longed-for property of giving a coarser grain, according as a part got darker, and that was valuable; so also small points of light stood out well, and detail of all kinds, but it was impotent in the very fine grays. The Klick process was then beginning to make a move. About this time Colonel Waterhouse invented a clever grain which we used for some time, and for a certain class of work it was excellent, but its half-tones, though powerful, were somewhat dull. The method is to take the mold as it is first washed off, and, while still wet and soft, dust it over with fine sand. Let it dry and when dry rub the sand off again. The impression left by the sand is very regular and sharp, and it retains its sharpness well during electrotyping, and although it has defects of its own, yet it is a very good method and quick. Its great want is more brilliancy in the dark tones, and also a smoothness in the lightest parts, so that they fail to separate themselves from the pure whites when a number have been printed. The proper mode is to get depth enough in all parts, and then bring the lights into order by hand work. Another method is coming into practice lately to cure this feebleness in the very light parts. It is to cast over the whole plate a fresh tint by re-graining it with resin or bitumen, and biting in with acid until a tone is produced. This tone may be stopped out earlier or later in some parts to save after-work, and, when all is cleared off, a proof is taken, and the lights are put into order by hand work. This procedure also improves the darks of many plates by steadying them. The new grain generally settles on the old prominences of copper, so that the effect is to deepen the old work and not to confuse it. Moreover, the two degrees of tint, where they do come together, or one upon the other, are mutually helpful, and give the look of mystery and depth so often valuable. One depth or one layer of tone generally has a hard and prominent effect, but a double tint looks soft and suggestive. This quality was noticed by the old mezzotint engravers, who very often laid a fresh ground over a plate, which to the ordinary person looked finished; then they had all their work

to scrape up again; but the plate was rich in proportion and worth the extra trouble.

This is a proper time to describe another great want of all natural photo-gravure plates. It is quite absurd to suppose that what a negative has not the power to get the copper plate made from it shall have. It is, however, very wise to gently work up a negative or transparency to effect that which Nature cannot do for it.

There are various methods of doing this. If rough texture in parts is desirable, the glass may be matt varnished on the picture side and the crayon applied on the grain. But if gentle tints are wanted, then the other side should be worked upon. It is, however, often noticeable that when a plate is produced, the hand work is too heavy or misapplied, and it is too late to go back again. This sort of work is most called for in the dark portions of a subject, and it is best not to try too much in other parts.

When this is, however, done, it is often only too plain that we have not depth enough in the plate. When an oil painting is placed against a print, it is easily seen that our scale is much shorter than the oil painting. Therefore an abundant power in reserve to give depth and power to the plate is advantageous, so that the printer need not make an opaque, heavy ink to get the print right.

The printer's ink should always bear some dilution for the start of a plate, and also for the reason that it is so common that a dark, dull solidity comes from a plate having no real depth in it, yet plenty of middling dark. I have seen a plate of Goupil's (whose process I have not further gone into, beautiful though it often is) brought well out by deep etching with acid on the top of the other tint, the lines of the etching being bitten, as usual, through a strong ground laid on. It is difficult to really blend etching with the tint, but if contrast is called for it will do. Some form of graver is better, because you regulate its depth so instinctively to the needs of each part of the work.

The lighter portions and the use of dry-point work, together with the scraper and burnisher in finishing, are too simple to need any time being spent on their description.

Printing deserves a word. I have found that careful work with the best possible materials is most essential. A paper with a coarse fiber, however excellent otherwise, will never do for photo-gravures. So, too, size must not be allowed. Thus the paper admired for etchings is quite unable to print photo-gravures; it is harder in texture and rough, so that it cannot enter into the tiny pits in the process plate. This is unfortunate, because the presence of size greatly adds to the brilliancy of the darks in a print, and that is what we most need from the process plate. However, we have to put up with the color obtainable on an absorbent paper.

It is worth while, before concluding, to touch upon the field and opening for photo-gravures. It cannot be contended that every subject is best done on this plan; and as the taste of men will from time to time demand every kind of subject, it must be evident that it will rest with us to confine our efforts to such subjects as have been proved to succeed best. In the matter of publication plates, there are so many fine etchings and such very fair autotypes obtainable, that the method of photo-gravure wants to be particularly guarded from betrayal by some mistaken choice of a thing that will cost much labor and then turn out

a failure. In plates for books, and in those folios of pictures from some locality now so frequently seen, it cannot hurt so much if there are partial failures, because they are not exposed to the public view so constantly, and also because if there is a failure there will also be several successes in the same lot.

One mode of use applicable to all kinds of printed books is to leave the space for a picture blank in the printing, and have the pictures printed on a thin India paper elsewhere, perhaps six, or eight, or ten together; these are cut up and pasted in the book at their right places. Mr. Linton's important work, "The Masters of Wood-engraving," is almost entirely photo-gravure, and the prints being treated as above, look very natural and fit in most easily without the least harm to the printed book itself, while it is not easy to ascertain that they are produced by an intaglio process at all. Yet the peculiar advantages of the process come out in the result, for the experts are said to wonder how it is that these reproductions are superior to the originals.

Of course, for artistic effects of great power this method is equally applicable, and it is well known that these finer efforts are the very ones that most distress printers and producers of books. Yet it is on these alone that the public sets the greatest value.

I hope I have not been too long and prolix in this little essay on so modern and interesting a subject. It appeared to me far more suitable to the requirements of all that the result of my own efforts in this branch should form the chief body of the paper, rather than to go into purely technical details and questions which are all very interesting to a very few, but which experience has taught me are quite discounted by the insatiable public on the one hand and by the infinite demands of art on the other.

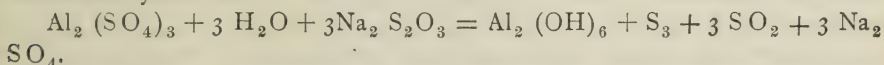
[From *Photographische Correspondenz*.]

A MIXED ALUM AND FIXING BATH.

BY ALEXANDER LAINER.

DURING the hot season certain kinds of emulsion plates are in a particularly disagreeable manner subject to filling of the film and bubbles in the fixing bath. An after-treatment of the plate with concentrated alum solutions or with alcohol serves to remedy the evil in some extreme cases, and this should therefore be met with by immediate application of the mixed alum and fixing bath.

The mixed alum and fixing bath is obtained by pouring together one liter of ordinary fixing bath with one-half to two liters of concentrated alum solution. But this fixing bath shows such a strong discoloration that it can be employed only after the principal reaction has passed and it has become clear to some extent. A complete clearing will not take place as long as alum and hyposulphite of soda act against each other, with continual separation of sulphur and aluminum hydroxide.



The chemical equation shows that dioxide of sulphur is also separated, which has a clearing action upon the plates. Sulphite of soda is formed from the hyposulphite of soda, and the fixing capacity will consequently cease finally.

The fixing baths fix considerably slower, whereby the filling and bubbles are more easily avoided. A disadvantage, though, is that the negatives become milky and contaminated; but this is overcome by wiping the negative with a soft sponge or a piece of chamois leather, to remove the superfluous precipitate.

During my studies and experiments about the fixing baths for gelatine emulsion, I made trial, to prevent the separation by neutralization of the ordinarily acid reacting alum with soda and ammonia, and then mixed with fixing soda. So-called neutral alum forms, as known, by neutralization of the alum; but in this way no results could be obtained; by application of sulphite soda it was different.

If a saturated sulphite of soda solution is added to a concentrated alum solution, a precipitate will form, but it dissolves again; a further addition leads finally to a limit, where a solution of the precipitate will not take place any more; during the reaction there is a strong smell of dioxide of sulphur observable. If such an alum bath is now mixed with an equal volume of fixing bath, the latter will remain clear.

Further tests proved that it is not necessary to advance to this limit with the addition of the sulphite of soda solution to the alum bath. I mixed 1,000 c.c. alum solution (concentrated) with 200-300 c.c. sulphite of soda solution (concentrated), and added to this solution an equal volume (therefore about one liter) fixing bath.

This mixed alum and fixing bath kept completely clear and undecomposed in open as well as in covered vessels. I reduced the addition of sulphite of soda in above formula to 100 c.c., and still obtained a clear alum and fixing bath, but of shorter durability. It is to be remarked, however, that, according to the quality of alum, the sulphite addition should be or may be increased or reduced. In one case there were 40 c.c. sulphite of soda solution (1:4), already sufficient for 1,000 c.c. alum solution, to avoid precipitations with the additional fixing bath within eight days.

This clear alum and fixing bath, possessing the advantages of similar mixtures, without showing their disadvantages, might be preferred to the ordinary mixed alum and fixing bath in cases, as mentioned in the beginning of this article.

BACK FOCUS.

DEAR BULLETIN:

In the *Photographic News* of July 5th, page 434, in an article on "Photographic Optics," by W. K. Burton, I must beg leave to take exceptions to some points, one in particular, in which he says, regarding "back focus": "It is scarcely ever of any moment to know it, and indeed it would almost seem as if the term had been invented by opticians for the sole purpose of hopelessly confusing the uninitiated, already suffering from quite sufficient confusion in the matter of lenses."

I know that the term back focus is very important to many, especially a dealer in photo apparatus, to whom, in selling a camera and lens, the knowledge is very essential in order that he may know as to whether the lens could be used on the camera or not. If such had to be a matter of practical test every time it would be very unfortunate. If knowledge of equivalent focus alone was necessary, and a party should buy a Dallmeyer Rapid Rectilinear of 33½ inches

equivalent focus, and a camera wherein the back lens of the combination came within 33 inches of the focus glass when closed, he would find it utterly impossible to photograph some objects; whereas, by knowing the back focus as being 31 inches, and securing a camera that was not over that distance from back lens to focusing screen when closed, there would be no object so far distant that he could not photograph it. Of course near objects would depend on the length of draw to the camera. Having seen considerable of the inside of apparatus manufactories, I assert that the knowledge of the "back focus" of a lens is not only very important, but necessary, and a great saving of time. As the article seems to be intended for the education or enlightenment of those who are not posted on the subject, I think the points should be placed in their proper light, and let the reader judge as to whether he desires to make use of it or not. It might be the means of saving considerable expense in selection of camera, and allow the buyer to order with confidence and safety exactly what would meet his wants.

Yours very truly,

ABE LIZZARD.

A VETERAN CALLS TO BOSTON.

NEWTONVILLE, MASS., July, 1889.

DEAR BULLETIN,—I have been trying to find opportunity to reopen communication with my photographic associates, more especially the readers of the BULLETIN.

I do not know that I shall meet with, or even deserve, recognition. When not under medical jurisdiction for the past year I have been on my travels, and most of the time without inclination to correspondence beyond the home circle. Besides, I have watched the semi-monthly issues of the BULLETIN and other publications relating to photography, and have found such a flow of good things from the pens of ready writers that additional contributions seemed needless.

During a recent trip to the Pacific Coast I saw much of our art, and took passing notes of what I intend noticing more in detail as leisure permits. My purpose in this letter is to speak of the approaching Convention and Exhibition of the National Association, to occur in Boston, August 8th to 10th. It has been well written up, officially and otherwise, already, and perhaps more inspiration and stimulation is not required.

Though practically retired from the ranks of active workers, I enjoy my position at point observation, and when the craft are on parade with their specimen work I like to catch views of the procession, for among the many I find lots of jolly good fellows with whom it was my pleasure and profit to meet in pioneer days. Something over twenty years since I had the privilege of welcoming to Horticultural Hall, Boston, the first convention of photographers ever held in America, and though it was looked upon as a doubtful experiment to organize and utilize such an association at that time, it proved a grand success; and though it afterward had a serious relapse, and came near dying from insufficient nutrition, it rallied under its new name and management, and to-day it is healthy and hopeful. It has not been my good fortune to attend its annual reunions for three or four years, but I have made note of its proceedings and been gratified with its results.

The contrast is refreshing when we consider the broad gauge theory and practice of the present and the narrow limits in which we moved in the undeveloped past. Verily we then "looked through a glass darkly," with but dim rays

of light and those wholly artificial. Now every good operator and practitioner, instead of concealing, reveals light, and through the various journals and monthly meetings gives his best thoughts and latest devices to his fellow artists.

"No man liveth unto himself." It does not pay. It belittles the soul and all its faculties. Talents were not made to be hidden, but for mutual exchange and profit; and as this principle is understood and practiced growth is more apparent.

We well remember the first display of the first convention—in 1868, if I am not mistaken. "Who is going to see it?" was the question from the incredulous and unbelieving. "Who will give a quarter for such a show?" And what presumption it was to call it an art exhibition in Boston, where canvas and color was exclusively "high art."

And yet the convention was a success, not only in the large attendance from many States in the Union, but in the sample work contributed. It was the first introduction of the best and most enterprising photographers to each other, the first effort at comparison and competition, and we well remember the pride and enthusiasm it awakened.

The twenty years' progress in the art since that convention has been simply wonderful in results. The third-class photographers of to-day excel by far the best sample work shown at that exhibition, while in the line of invention and discovery of appliances and methods the advance has been incomparable and incomputable.

During these years the public taste has been educated and appreciative just in proportion to the efforts of the artist in raising the standard of his work. Much is now required where little is given, and the club photographer perils his reputation, if he has any, when he scabs his work to "cut rates." The class album, while intended to win patronage for next year, often gets left in the race for something better and cheaper.

But I am digressing, my purpose in this letter being more intended for an exhortation than discussion. The Convention and Annual Exhibition for 1889 is close at hand, and I but repeat what others have more forcibly written and spoken when I say that in no way can so much be gained in real value as by attendance upon these conventions. If you are wide awake and withal ambitious for improvement, you will give and get inspiration from these annual interviews. If you are half asleep and nearly discouraged, the more need of bestirring yourselves to see what your fellow craft are doing in the world about you.

Doctors are having their annual convocations, and leave their patients for a week's absence in search of new prescriptions. The patients often rally with hope of healing balm on the doctor's return with his new thoughts and improved treatment. If the patient is not benefited the doctor is, and he goes to his work with new life and zest.

No doubt a warm welcome is ready for the brethren in Boston, especially if the season has anything to do with it. The focal point is a good one, and no doubt Local Manager Hastings and his associates will be on hand for escort duty. I hope to be there, and regret I have no art trophies to contribute. While I anticipate meeting many of my former friends in the business, I am saddened with the thought that some have gone to the other shore who, by their presence and generous contributions, did so much to promote the growth of the art and the Association of which they were valued members.

G. H. LOOMIS.

PHOTOGRAPHERS' AND ARTISTS' MUTUAL BENEFIT ASSOCIATION.

HAVING received numerous letters of inquiry concerning the Photographers' and Artists' Mutual Benefit Association, and its plans and purposes, we desire to state to the fraternity that in the first place said Association is being organized and is calculated to embrace in its membership every respectable and worthy photographer and artist in the country.

The Grand Council of said Association might be termed the Executive Committee of the Association.

It is duly incorporated under the laws of the State of New York, so as to be able to sue, be sued, and to transact all business necessary for the successful management of the affairs of the Association. The Association was inspired by the general complaint which prevails throughout the land against the unreasonable and ruinous reduction in prices below the figure at which first-class work can be produced.

The public, who appreciate and love art, join with the artist in the demand that the prices shall not be forced below the figure for which good work can be done. The practice of some photographers to exhaust their own resources by forcing prices below the cost of production, in order to drive their neighbors out of the business, cannot be called fair competition and is degrading to the profession. The purpose of this Association is to stop this practice, and to cause to be established among its members a graded scale of prices, that will be fair and equitable, and enable each to receive a fair and reasonable compensation over the cost of production.

It has a bureau of information concerning photographers and artists, and the needs and requirements of the profession, by which it is enabled to assist the applicant either for help or for a situation, and to aid members in the improvement of their work.

It proposes to help dignify the profession and enable it to command the respect of the public, and as soon as practicable to require those who engage in the profession to obtain certificates of competent experts as to their qualifications.

It further purposes to be at all times on the alert and ready to assist the struggling photographer and artists, and to use its influence and strength in crushing out any and all evils that may tend to degrade or injure the profession. "In unity there is strength," and from the enthusiastic and hearty support which has been accorded this movement throughout the land, we are convinced that it came none too soon, and can be pushed none too fast. We are aware that reforms are seldom effected without meeting objectors, who say "it cannot be done." To such we wish to say now that we have the ways and means to accomplish the objects and aims of the Association.

Different cases will require different treatment. Just what plans will be pursued in each case of course we will not be expected to make public. But all may rest assured that the plans are well formed and bound to succeed. We propose to protect the members of this Association, and guarantee them against any loss by fidelity to the order.

There is no turning back. This Association has its work to perform, and will do it honorably and fearlessly.

ABRAHAM BOGARDUS, *President.*

FRANK CADY, *Secretary.*

P. S. RYDER, *Treasurer.*

A PHOTOGRAPHIC TRUST.

For some weeks a breeze seems to have been bearing, throughout the length and breadth of the land, whisperings of the formation or proposed formation of something in the nature of a "trust," that is expected to have some wonderful influence for good on the position and prospects of the photographic fraternity. But the title is in bad odor with all but the few whose pockets the organizations it represents are intended to fill, and so the irrepressible A. Bogardus, who confesses himself to be its President, and is supposed to have been its originator, buckles on his armor in its defense, without, in our opinion, in any degree mending the matter.

Ignoring the malodorous "trust," he says—and emphasizes the statement by a pretty free use of italics—that, after great deliberation, the prime movers in the matter have combined and formed a "Photographers' and Artists' Mutual Benefit Association," the avowed object being a determination to stop, if possible, "rate cutting and its attendant evils." There may be something more and behind this, as the writer rather mysteriously says he only gives the facts *so far as they are made public*. There may, we say, be something behind this that will really be a benefit to the photographic fraternity. The Photographers' and Artists' Mutual Benefit Association may so win the confidence of the great body of the people as to enable it to establish an examining board—mainly of the second class of members, the artists, of course, whose diploma shall be a guarantee of the ability both technically and artistically, but especially artistically, of the holders. Or it may establish a school, or many schools, where, under competent teachers, such technical and art knowledge may be obtained. Or the Association, recognizing the scientific basis of the art, may equip suitable laboratories, and subsidize sufficiently able experimenters to look into, and, if possible, resolve the various difficulties that still cast a shadow over photography; to, for example, explain the nature of the latent image; explode, or make practicable, the photography in color craze; discover a unit of light by which the true relative sensitiveness of plates may be ascertained; or otherwise settle the hundred and one other questions, one or other of which daily crop up to bother the photographer, whether he calls himself amateur or professional.

If, however, the Association aims at none of these things, but means to confine itself and its operations to the object indicated by its President, that is, to stop *rate cutting*, then we have no hesitation in saying that it will spend its money in vain and its strength for naught. Is there, or can there be a "rate" in the prices charged for photographs? The answer will depend on the view that is taken of photography. If by a photograph we understand merely a representation of what may be placed before the lens, as in the case of the ballet girl on tip-toe with skirts lifted to a level with her head, noticed on another page, then its value may be fixed at a cent for so many square inches. When, however, it takes the form of the "fisher-girl," noticed on the same page, the *rate* idea is altogether out of the question, as the value is dependent upon the status, ability and popularity of the author. Even A. Bogardus and the members of the Photographers' and Artists' Mutual Benefit Association must have heard of Sir Frederick Leighton and Millais, each of whom get dollars by the thousand for a portrait; and although they may not have heard, they know of the existence of Tom Brush and Ben Palette, who are always willing to paint the landlord and his wife for a week's board, and to add the daughter for an unlimited

supply of beer. The absurdity of those four *artists* entering into a league to establish a "rate" of prices for their work will be evident to the most obtuse reader, and a little consideration will show the equal absurdity, although in a less degree, of the attempt to fix a rate among photographers and photographic artists.

If, therefore, there is no "rate," there can be no cutting; and as the prevention of "rate cutting" is the sole avowed purpose of the Photographers' and Artists' Mutual Benefit Association, it is left without a leg to stand upon.

It may be, however, that A. Bogardus and his satellites, in speaking of "rate cutting" mean merely reduction in prices, and that the efforts of the organization are to be directed against that. If so, then we have no hesitation in predicting for the Association a most signal failure. Trusts or combinations, or by whatever other name they may be known, having for their object the artificial increase in the price of anything, are only possible so long as the thing sought to be influenced is kept out of the open market by protection. The most rabid protectionist can hardly hope to see photography protected, as that could only be done by something like a return to the ancient system of monopolies, and we doubt whether there be a single member of the combination bold enough to advocate that.

With photography free to all, with workable outfits at such prices as they may now be bought for, and with which any one of average ability may, after a few lessons and a little practice, make pictures that will, as yet, unfortunately, please a large proportion of the people, it would be as easy to sweep back the advancing tide as to reverse the laws of political economy, which are as unchangeable as the everlasting hills, and which declare that photographic prices, like the values of all other things, are and ever shall be dependent on the relation to each other of the "supply and demand."

Do we, then, undervalue the possibilities of the proposed combination, and counsel our readers to sit quietly down and content themselves with the present average scale of prices obtainable for their work? By no means. If the Photographers' and Artists' Mutual Benefit Association, with its alleged large funds at its back, will establish in various centers throughout the country institutions where photographers may acquire sound art training and receive certificates of qualification after proper examination, and from which influence would emanate that would teach the people generally how to appreciate the higher class work, prices would adjust themselves without abnormal effort of any kind.

It is true that there will always be a residuum of the people who will be pleased with inferior work, and always a few of the untrained artisans who will supply it at prices only a little in advance of the cost of material; but the great body of good men, then, will, as do the small body of high-class workers now, be able to command prices according to the nature and value of their work.

Art is different from manufacture, inasmuch as for it there can be no exact standard or value computation, the individuality of the artist entering into and influencing the work, and the individuality of the buyer or employer being an important factor in his decision as to the style that he most highly appreciates.

When our ideal of photography, as thus indicated, is reached—and the Photographers' and Artists' Mutual Benefit Association may do much to bring it about—it will be with it as it is with painting, although, of course, in a much less degree. A man's work will be recognized by its style or individuality, and there will be as many styles as there are artists, while an educated and appreciative

public will no longer go to the gallery that turns out the greatest number of square inches of picture to the dollar, but to the artist whose style and class of work please them best.—*The Beacon*.

ANTHONY'S PRIZES FOR BROMIDES.

OUR publishers offer for competition at the Boston Convention of the Photographers' Association of America, August 6 to 10, 1889, the following prizes for the users of Anthony's Reliable Bromide Paper :

For the best collection of Plain Enlargements and Contacts.....\$100

For the best collection of Crayon Worked Enlargements..... 50

The conditions for competition will be as follows :

First—For the \$100 prize the prints must be at least six in number and must embrace both Contacts and Enlargements.

Second—The awards will be made for the best collection as a whole.

Third—Competitors must forward their exhibits prepaid so that they will reach Boston by the first of August.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a card stating the name and address of the exhibitor and his private mark, a letter being sent also with same private mark, but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. Applications for space must be sent to the Secretary of the Association, Mr. O. P. Scott, 2220 Indiana avenue, Chicago, Ill.

E. & H. T. ANTHONY & Co.

AIR BRUSH MANUFACTURING COMPANY'S PRIZES.

THE Air Brush Manufacturing Company will offer the following prizes at the Convention of the Photographers' Association of America, to be held in Boston, August 6 to 10, 1889 :

First.—One complete Air Brush will be given for the best free-hand portrait done with the Air Brush. This may be in black and white or water colors.

Second.—One complete Air Brush will be given for the best water color portrait, over any print, finished with the Air Brush.

Third.—One complete Air Brush will be given for the best portrait in black and white, over any print, finished with the Air Brush.

OUR ILLUSTRATION.

THE four views with which we illustrate this issue of the BULLETIN are from a series made by Dillon, of Philadelphia, and kindly furnished by him for our special use in this issue. They are only a few of some of the best views of the work of destruction at Johnstown, Pa., which we have seen. The views are all copyrighted by the artists, and form a series of pictures of historical interest. It

is probable that no calamity since the earthquake at Lisbon has resulted in such a fearful loss of life as occurred in the Conemaugh Valley this spring. The pictures will increase in value as time rolls by.

AMERICAN INSTITUTE.—PHOTOGRAPHIC SECTION.

SPECIAL NOTICE.

THE committee on the annual outing of the Section desire us to announce that a change of date has been decided upon from August 27th to September 3d. The annual outing and dinner will take place at Hotel Brighton, Coney Island, at the latter date, in order that those who desire to take surf pictures may have a better opportunity to do so.

BOSTON CONVENTION.

Secretary SCOTT sends us the following information: You might say in your journal, that all railroads will make a rate of a fare and one-third for round trip to Boston and return. Tickets good from any point, giving all parties a rate from their own home.

This will be much better than to be compelled to go to certain points and then get rate from there. Tickets good for three days before opening of convention and three days *after closing of same*, before leaving Boston. This will give a chance for all to see Boston and surrounding points of interest before returning home.

Very truly yours,

O. P. SCOTT.

INSTRUCTIONS TO DELEGATES.

THROUGH the courtesy of the Central Traffic Association, persons attending the Boston Convention will be granted a reduction in their return railroad fare only, under the following circumstances and conditions:

First.—Each person must purchase (not more than three days prior to the date of the meeting nor later than three days after the commencement of the meeting) a first-class ticket (either unlimited or limited) to the place of meeting, for which he will pay the regular tariff fare, and upon request the ticket agent will issue to him a certificate of such purchase (Form 2), properly filled up and signed by said ticket agent.

Second.—If through tickets cannot be procured at the starting point, the person will purchase to the nearest point where such through tickets can be obtained, and there repurchase through to place of meeting, requesting a certificate properly filled out by the agent at the point where repurchase is made.

Third.—Tickets for the return journey will be sold by the ticket agents at the place of meeting at one-third the highest limited fare, only to those holding certificates (Form 2), signed by the ticket agent at point where through ticket to the place of meeting was purchased, and countersigned by the secretary or clerk of the convention, certifying that the holder has been in attendance upon the convention.

Fourth.—It is absolutely necessary that a certificate be procured, as it indicates that full fare has been paid for the going journey, and that the person is therefore entitled to the excursion fare returning. It will also determine the route via which the ticket for return journey should be sold, and *without it no reduction will be made*, as the rule of the association is that "No refund of fare can be expected because of failure of the parties to obtain certificates."

Fifth.—Tickets for return journey will be furnished only on certificates procured not more than *three days* before the meeting assembles, nor later than *three days* after the commencement of the meeting, and will be available for continuous passage only; no stop-over privileges being allowed on tickets sold at less than full fares. Certificates will not be honored unless presented within *three days* after the date of the adjournment of the Convention.

Sixth.—Ticket agents will be instructed that excursion fares will not be available unless the holders of certificates are properly identified, as above described, by the secretary or clerk, on the certificate, which identification includes the statement that fifty or more persons, who have purchased full fare tickets for the going passage, and hold properly receipted certificates, have been in attendance at the meeting.

The certificates are not transferable, and the signature affixed at the starting point, compared with the signature to the receipt, will enable the ticket agent to detect any attempted transfer.

N. B.—Please read carefully the above instructions, be particular to have the certificates properly filled and certified by the railroad agent from whom you purchase your going ticket to the place of meeting, as the reduction on return will apply only to the point at which such through ticket was purchased.

Yours truly,

O. P. SCOTT.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the Photographic Society of Japan was held on Friday, June 7th, at the Chamber of Commerce, Tokio. Professor Kikuchi took the chair at 4 P. M. His Excellency Viscount Enomoto, Minister of Education, was elected to the post of President of the Society by acclamation.

After some formal business, the special business of the meeting was begun. This was a demonstration, by Mr. K. Ogawa, of Willis' platinotype process. The capabilities of the process were shown by a set of mounted prints that were hung on the walls of the room. The appearance of a platinotype print is quite different from that of an ordinary photograph. The image is of an engraving black, and there is a complete absence of any surface gloss. The prints have, moreover, the inestimable advantage of being absolutely permanent, in the sense that they cannot be destroyed but by the destruction of the paper support. The process of coating the paper was shown, and that of development was demonstrated on some prints that had previously been exposed to daylight in printing

frames in the usual way. There was a good attendance of those interested in the "black art," and they all took a keen interest in seeing the magic way in which the picture appears in the developing solution.

Mr. Ogawa spoke chiefly in Japanese, and some additional explanation was given by Professor W. K. Burton. It was explained that the paper was coated with a mixture of certain iron and platinum salts, that the light in the printing frame affected the former, which, in its turn, had the power, when dissolved by the developer, of reducing the platinum salt to the metallic state, so that an image in metallic platinum in a very fine state of division, or "platinum black," as it is commonly called, resulted.

The Society will shortly hold a camera "field day," when, if favored with fine weather, a very pleasant excursion is to be expected.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, July 3, 1889, with Mr. Samuel Sartain in the chair.

The Secretary announced the death, on June 20th, of Mr. Joseph J. Fox, a member of the Society, and late editor of *Science of Photography*.

The Committee on Lantern Slides presented the following report:

"Your Committee on Lantern Slides respectfully report that a detailed statement of the affairs of the American Lantern Slide Interchange has been received from the manager, Mr. George Bullock, of Cincinnati. This includes an account of the expenses of the Interchange, and a report of the number of slides contributed by the nine societies to the series of the season just passed. It is probable that the Executive Committee will meet during the present month to make arrangements for the current year.

"Our report upon slides shown at the Conversational Meetings of the Society covers two months. At the May meeting the slides of the Cincinnati Camera Club were shown. Mr. Rau also exhibited some fine views of the naval parade during the Centennial celebration in New York of the inauguration of the Federal government and of the first President. Mr. Dillon showed several figure studies and landscapes, which were much enjoyed. Mr. Redfield, on behalf of Mr. Charles R. Pancoast, exhibited a choice collection of slides made by him on gelatine dry plates.

"At the June meeting Mr. Rau showed about forty slides from negatives of the Johnstown disaster, secured soon after the event. They were a timely and highly interesting record of the physical effects of the great flood. Mr. Fellows also showed some slides of the same subject from negatives made by Mr. Dillon. He also threw upon the screen a number of foreign views and flash-light studies. Mr. Wood had several of his admirable figure studies."

The Committee on Membership reported the election of the following active members: John C. Breuker, John P. O'Brien, Washington Van Dusen, John F. Simons, Dr. Henry Weston, Leib Harrison Dulles, John D. Bliss.

Mr. Sartain reported for the Committee on Excursions that two "Day" excursions had been given, one on June 15th, to Chadd's Ford and along the Brandywine, and one on the following Saturday, on Chester Creek, from Cheyney Station to Darlington, both of which were fairly attended.

Mr. J. M. Walmsley exhibited a negative made on the New Eastman Flexible Film. In reply to a question as to the use of films in cut sheets, he said that difficulty would be found in using them in that way, and he thought the manufacturers had announced that the films should only be used in continuous sheets in the roll-holders. Adjourned.

EDMUND STIRLING,
Secretary pro tem.

LYNN CAMERA CLUB.

THE Lynn Camera Club have moved from their recent quarters, at 347 Union street, and stored their goods until they can obtain more suitable quarters. A syndicate of members is now being formed to build a two-story clubhouse on the estate of Nathaniel J. Bacheller, 40 Broad street. The rooms will be finished with special reference to the convenience and comfort of members, and will have sky and side lights for taking portraits, with suitable background to be furnished by the Club. The dark room will receive especial attention in the manner of construction, and will be large and receive the best of ventilation, which will be a decided advantage to those wishing to use it during the summer months. It will be fitted with a large sink, lockers and such other conveniences as the Club may be able to add.

The club-room will be large enough to accommodate a goodly number at slide exhibitions, and will have a screen for that purpose at one end. The building will be wired for incandescent lighting, and it is probable that the

light will be used in the near future. There are already a number of amateurs who have signified their intention of joining the Club as soon as new rooms are obtained, and the committee are desirous of increasing the applications to the largest possible number for election at the first meeting held in the new rooms. Amateurs wishing to join are requested to hand their names to any member of the Club, or send names to either member of the Committee on Membership, viz.: W. H. Drew, 404 Union street; E. F. Bacheller, 40 Broad street; J. W. Gibboney, care of T. H. Electric Co. Members of other clubs, who are stopping in the city, can be accommodated with a room for changing plates by application to the Treasurer, at 40 Broad street. The Club is more than ever alive to the increasing interest in the art of photography, and intends to have quarters that will be a credit to the members and compare favorably with those of the larger cities.—*Lynn Daily Item.*

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, TUESDAY, MAY 14, 1889.

(Continued.)

THE USE OF THE SWING-BACK OF THE CAMERA.

The *President*—The discussion that occurred at our last meeting proved so pleasant to many of the members that it was thought that something of a similar character might be considered here; therefore, in talking to Mr. Duffield, I suggested the subject of "The Swing-back of the Camera," and the idea occurred to me from the fact that a gentleman in Buffalo, whom I have never met, but who has, nevertheless, proved a pleasant correspondent, recently wrote to me his own impressions about the use of the "swing-back of the camera," and he came to the conclusion, after experiments with it, that it was a decided disadvantage from every point of view, rather than in any sense an advantage, and it seemed to me worth while to bring the matter up. Of course it cannot be denied that the use of the swing-back throws a plate out of focus, and that disadvantage has to be overcome by what we call "depth of focus" of the lens. We all know that when we use a nearly open stop of a lens, and use a swing-back, there is a decided blurring of a portion of the picture that we want to get straight, and therefore it is necessary to use a smaller diaphragm in order to get "definition" at the top of a picture, or possibly sometimes at the side, and he brought forward this argument in his letter against the use of a swing-back, and I replied by saying, in substance, that the use of it was to straighten the lines, and that it was not to get the different parts of the picture in focus.

Of course we have all noticed that, while we do get straight lines with the use of a swing-back, still the focus is very much disturbed. I thought I had his letter, with a diagram in it illustrating his point, but I find what I took to be that letter, from the outside of it, is another one, therefore I cannot show the diagram; but the general proposition is, if any of the members care to discuss it, whether they have found in their experience the use of the swing-back as beneficial, or whether its drawbacks were sufficient to induce them to have very little to do with it. I have not introduced the matter to your attention in a very clear way, nevertheless. I hope some of the members will give their experience in regard to it.

Mr. BEACH—Mr. President, I have a good deal of experience in photographing buildings, and buildings standing up on high hills too, and I have found that I could not get a satisfactory picture unless I used the swing-back. In doing so it necessarily brings the circle of a picture—the edge of the circle that the lens cuts—towards the edge of the plate, and unless the small stop is employed the picture will be, as you say, considerably out of focus; and therefore, perhaps, it is necessary to use a very small stop when you go to such extremes.

Mr. A. L. SIMPSON—My experience with the swing-back is, that it is not absolutely useless. In the first place, I have always used my swing-backs—I always raise my lens as far as I can and tilt my front so that the front and the back of the camera are absolutely perpendicular, and I throw the lens up as high as I can, so that the light won't cut it entirely off.

The President—Possibly, owing to the notices not having been out quite so long as usual, the members are not prepared to discuss this question, and it is possible that the theoretical bearing of it might be brought up again. I know I was at one time very much puzzled to get at the method of using the swing-back, because it always seemed to me that the picture came out better by swinging the back in just the opposite direction—that is, take certain cases where it was not very obvious—where you could not readily distinguish on the ground glass whether the picture you were arranging for was in straight line; and it was not until I looked into the matter fully that I settled in my own mind what was demanded under the circumstances; that the ground glass shall be as nearly at right angles to the axis of the lens as possible.

merely suggest them as compounds to be used for that purpose.

The President—Are they likely to be found on the market or must they be manufactured?

Mr. STEBBINS—They are not on the market, but they can be easily made. I will give instructions for making them when I complete the paper for publication. They are all commercial dye stuffs.

The President—Is any compound that will reduce silver salts likely to become a developer?

Mr. STEBBINS—I think so; yes, sir; although that is a hard question to answer.

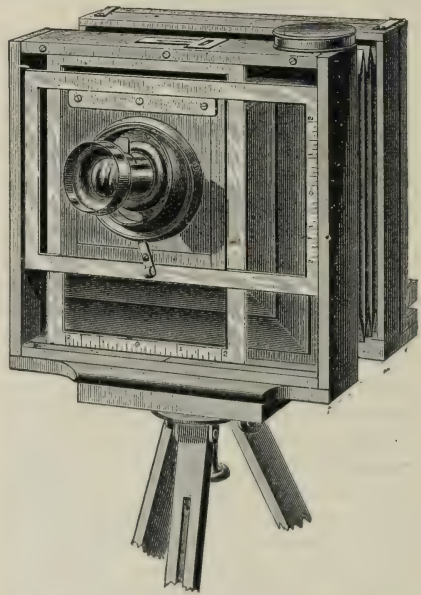
Mr. BEACH—In your investigations have you found them more powerful than some others?

Mr. STEBBINS—That I cannot really say. I have not tried them. Some of them appear to be very powerful.

Mr. BEACH—I move a vote of thanks to Mr. Stebbins for his very entertaining paper. (Motion carried unanimously.)

The President—I believe there is a new camera to be exhibited. Mr. Beach has it in charge.

Mr. BEACH—The camera which I have the pleasure of explaining to you this evening is a view camera, made by Messrs. S. Wing & Co.,



REGULAR MEETING, TUESDAY, JUNE 11, 1889.

The meeting was called to order at 8.15 P.M., President CANFIELD in the chair.

The President—The first thing on our programme to-night is the paper by Mr. James H. Stebbins, Jr.

Mr. Stebbins then read his paper. (Which will appear in a later issue.)

The President—Will the properties which you have named be important in the way of developers?

Mr. STEBBINS—I think they are of great importance in reducing silver salts in that direction. I have never tried any of these. I

of Boston. This size is adapted for 5 x 8 plates, and has a reversible back so that the plate can be used up or horizontally. I notice one improvement is in the method of fastening the folding bed. In some cameras the method used is an ordinary thumb screw to lock the bed. In others there are two pivoted hooks, which, in being pushed down, clamp the bed. This construction is based somewhat on the plan, but in a slightly different way. A flat spring hook is attached to the under side of the center brace of the bottom of the bed. The brace is pivoted to inside of the rear cross bar of bed, and when you turn the bed down the spring underneath still stays up above the cen-

tral cross bar until you press down the central portion of the folding bed with your thumb. When you do that the bed is clamped by the hook and held rigid, permitting the rear of the camera to be drawn out.

(To be Continued.)

Bibliography.

PROCESSES OF PURE PHOTOGRAPHY. By W. K. Burton and Andrew Pringle. New York: Scovill & Adams.

With two such gifted writers that at the same time are prominent photographers, we are not surprised to find this volume excellent in almost every particular. In the space of two hundred large octavo pages the authors give an exhaustive discussion of processes that are purely photographic. After speaking of the historical phases of the art, the theories, the apparatus, and general nomenclature, the wet and dry collodion methods are briefly but very effectively noticed. Then follows the gelatine emulsion process and its variations, which are treated quite thoroughly. The manufacture of emulsions by the various methods is given, together with the coating of the plates. Chapters follow on the camera in the field; exposure and development; paper and film negatives; orthochromatic photography; printing processes, including bromides, platinum and carbon; together with enlargements, lantern slides and the working up of residues. From this enumeration of topics our readers can judge of the wide field of work that the volume covers, and the names of the authors are a sufficient guarantee of the thoroughness of the work.

NOUVEAU GUIDE PRATIQUE DU PHOTOGRAPHE AMATEUR. Par G. Vieuille. Paris: Gauthier-Villars et fils; 55 Quai des Grands-Augustins.

This is the second edition of an excellent little volume issued by a well known firm of French photographic publishers. As usual with the publications of this house, the book is finely printed and illustrated. The subject matter is well treated by the author, and in a manner calculated to encourage the amateur photographer and make his way plain for him. Those of our readers that are natives of the land of France will find the volume very useful.

LES LEVRS PHOTOGRAPHIQUES et la photographie en voyage. Par le Dr. Gustave Le Bon. Paris: Gauthier-Villars et fils, 55 Quai des Grands-Augustins.

This is one of the first volumes in the French language that we have seen treating of the

subject of photographic surveying. It is very carefully written, and gives in a clear and concise manner the apparatus and methods used. To those of our readers who are interested in this recent application of photography we can recommend the little volume as a desirable addition to their libraries. It is a small octavo of 130 pages, and constitutes the first part of the treatise on the subject.

L'HYDROQUINONE. Par George Balagny. Paris: Gauthier-Villars et fils, Quai des Grands-Augustins 55.

This is a small pamphlet of twenty-four pages, giving the author's experiences with hydroquinone. It contains many varieties of applications of the developer, and is a valuable contribution upon the subject.

DER KOHLE-DRUCK. Von Dr. Paul E. Liesegang. Düsseldorf: Ed. Liesegang's Verlag.

This is the ninth edition of this excellent little treatise on carbon printing. The fact that so many editions have been issued is sufficient evidence of the value of the volume. It is a small octavo of about 140 pages, well illustrated and printed.

DIE AMATEUR PHOTOGRAPHIE. Von Robert Talbot. Berlin: Romain Talbot, 10 Bruderstrasse.

The little volume of sixty pages before us is the work of the son of our good friend, Romain Talbot, of Berlin. It is intended as a guide to beginners in photography, something after the manner of "How to Make Photographs," by T. C. Roche. It is well written, full of formulas, illustrations of useful apparatus, and everything necessary to the success of the amateur. We must congratulate Mr. Robert Talbot upon the production of so excellent a volume.

THE AMERICAN AMATEUR PHOTOGRAPHER. Vol. I, No. 1. Edited by F. C. Beach and W. H. Burbank. Brunswick, Me.: W. H. Burbank, Publisher.

This is the first number of a new American monthly magazine devoted to the interests of amateur photography exclusively. It is well presented, contains two photo-gravures and forty-six pages of type, well printed. That such a volume can be issued at the low figure of the subscription price speaks well for the Maine printers. As a journal it is well up to the times; contains original articles by the editors and others, reports of papers read before societies and society proceedings. With

editors as well known as the two gentlemen who have started it, the new journal should be a success, and we hope it will receive all the rewards that such good efforts deserve.

THE OPTICAL MAGIC LANTERN JOURNAL AND PHOTOGRAPHIC ENLARGER. London: Taylor Bros., Salisbury street, Fleet street, E. C.

This is a new English paper, devoted to the Lantern and Enlargements, and edited by Mr. J. Hay Taylor, the son of Mr. J. Traill Taylor. We are sure that a good journal devoted to the interests of the lantern will succeed, especially in England, and judging from the contents of the initial number of the journal before us, this new enterprise looks like success. Those of our readers interested in the lantern will find this journal very useful.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—C. A. B. writes: Will you please inform me if I can get a good lighting in a gallery with no side lights? I am almost compelled to change my location, and to locate where I would like could not have any side light. I know of one gallery that is lighted in that way, but cannot say if he gets a good light or not.

A.—The lack of a side light in a studio is a misfortune; but the difficulty may be over-

come by having a large white screen or dead white wall on the side of the studio, with curtains above and below to modify the effects to suit.

Q.—J. O. G. writes: Would you please inform me what causes the blisters on albumen paper, and which is the best remedy? As soon as I put the prints into the hypo bath they get this so-called small-pox, and after being in the bath about five minutes, some get large blisters, which increase in number in the salt and washing. I have tried several remedies with but little success.

A.—Use a salt bath after toning, and before fixing, and take care that the bath is not too warm, not above 65 degrees Fahr. A little alum in the salt bath is also very good. The hypo should not be stronger than one in ten in warm weather, and the salt bath should be used again after fixing. See answer to A. S. in last BULLETIN.

Views Caught with the Drop Shutter.

SUN AND SHADE, the now well established photographic illustrated monthly, comes to our table full of interest. Numbers 9 and 10 are very interesting issues, and well worth the small price paid for them. It is surprising that so much good photo-gravure work can be sold for so little.

CRUISING IN THE CASCADES, by G. O. Shields ("Coquina") is a new photographic-ally illustrated book on hunting and fishing, published by Gayton A. Douglass & Co., of Wabash avenue, Chicago. To all lovers of photography and sport the volume will prove very entertaining.

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WINIFRED

BY

E. DECKER, CLEVELAND, OHIO.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

AUGUST 10, 1889

Vol. XX.—No. 15.

DECIMAL WEIGHTS AND MEASURES.

WE are glad to note that new efforts are being made to induce photographers to adopt a more rational system of weights and measures than the one now in use. Since photographic processes are also chemical processes, it is a little surprising to note that every chemist worthy of the name uses decimal weights and measures, while almost every photographer uses a most confusing mixture of at least two systems. But we think that the principal difficulty that photographers encounter is the needless complications into which most writers upon decimal (metric) weights and measures drift, when trying to recommend its adoption. We see an interminable list of prefixes in Greek and Latin spoken of as simple to learn, and with a meaning supremely wonderful. Now, the fact is most of these prefixes are not used by chemists in general. They never talk about a decameter; but say ten meters. Neither do they call the tenth of a liter a deci-liter. In every country where English is spoken in the chemical laboratory, we hear such words as meter, ten meters, one hundred meters, etc.; or liter, tenth of a liter, cubic centimeter (one hundredth of a liter), the latter being also used as a unit, giving ten, one hundred, or one thousand cubic centimeters. In the case of weights no English-speaking chemist ever talks of a decagram, but says ten grams; the fractions of the gram are called tenths or hundredths, except the milligram, which, like the cubic centimeter, gives us tens, hundreds and a thousand milligrams (one gram).

Perhaps we can be better understood if we give the English method of using the metric system as practiced in the chemical laboratory. Of course the basis of the system is a measure of length called *a meter*; it is immaterial now what the length is in English inches, it is best not to know it in the beginning. If we take one-hundredth of this length and cube it, we get one *cubic centimeter*, and this volume of water at a standard temperature is called *one gram*. We have thus the simplest possible relation between length, volume and weight. Furthermore, this is all there is to learn in the system: meter, cubic centimeter, gram.

To show its application and the way an English-speaking chemist would use it, let us take a formula to be made up as follows:

Sodium sulphite.....	20 grams.
“ carbonate.....	10 “
Pyro.....	5 “
Water.....	100 c.c.

Reading this the chemist would say, take 20 grams of sulphite, 10 grams of carbonate, dissolve in 100 cubic centimeters of water, and add 5 grams of pyro. According to the method of instruction usually given, the statement would be thus: 2 decagrams of sulphite, 1 decagram of carbonate, dissolved in 1 deciliter of water, adding 5 grams of pyro.

This last method is the stumbling block to the introduction of the metric system of weights and measures. The use of the English names for the fractions and multiples of the meter, cubic centimeter and gram makes the matter so simple that the wayfaring man, though a fool, cannot err therein.

We will not consider the question of getting metric weights and measures; they are as easily procurable as any others, and just as cheap.

But somebody will say, Yes, this is all very good when you have a metric formula and metric weights and measures. But suppose you have an English formula and only metric weights and measures? In this case only a very little more knowledge is necessary, with a sprinkling of common sense. Let us take an English formula, Carbutt's developer, as given in the boxes of plates:

No. 1.		No. 2.	
Water.....	10 ounces.	Water.....	10 ounces.
Sulphuric acid.....	1 dram.	Sulphite soda.....	2 “
Sulphite soda.....	4 ounces.	Soda carbonate.....	2 “
Pyro.....	1 “	Potash carbonate.....	1 “
Add water to.....	16 “	Add water to.....	16 “

Everybody knows that a pint of water weighs one pound, Avoirdupois—practically—therefore one fluid ounce of water weighs one ounce Avoirdupois. If, therefore, we call all the ounces in the above formula grams, the matter is simple enough, except the sulphuric acid. In this latter case we must remember that one fluid dram is $\frac{1}{8}$ of an ounce, hence in our transposed formula it will become $\frac{1}{8}$ of a gram (a full tenth will be close enough).

But 16 grams of water are 16 cubic centimeters in the metric system, and this is very small. However, it is only necessary to multiply each set of figures by ten or one hundred to secure any desired quantity of the two solutions. Converting the ounces into grams and multiplying each set of figures by one hundred, we get the following:

No. 1.		No. 2.	
Water.....	1,000 c.c. (grams.)	Water.....	1,000 c.c.
Sulphuric acid.....	12 “	Sodium sulphite.....	200 grams.
Sodium sulphite....	400 grams.	“ carbonate.....	200 “
Water to.....	1,600 c.c.	Potash “.....	100 “
		Water to.....	1,600 c.c.

We have entered rather deeply into the discussion of this subject, as we note that efforts are now being made to induce photographers to adopt the metric system in England. A committee of the Photographic Club make the following statements in their report:

"The demerits of the present British system require but little consideration to condemn it. The absence of any definite unit or integral subdivisions, and the different values attaching to the denominations, lead to vagueness and error, while the difficulty of making calculations and of translating foreign formulas is a constant source of trouble, and no modification of the present system has come before us which is free from these faults.

"On the other hand, a very little experience of the metric system proves its simplicity, and the fact that it is universally adopted in scientific literature and practice, and that it has always been in actual use on the Continent for photographic purposes, points to it as the only alternative to our own defective system. It may be mentioned that the cost of the decimal weights and measures does not exceed that of those now in use.

"It is hoped that the Photographic Club, in adopting this system, will have the support of all the metropolitan and provincial societies of the United Kingdom, and if at the same time the representatives of photographic literature, and plate makers generally, some of whom have already signified their acquiescence, can also be prevailed upon to lend their aid, it would, perhaps, more than anything else, tend to the universal employment of the metric system amongst authors and users of photographic formulas."

In view of the above, we earnestly urge all interested to look into the question, and if we can come to an international agreement on the matter, it will be a source of great comfort to all concerned. The present system of railroad time in the United States was brought about by the mutual agreement of the railroad officials, and they would not now return to the old system if they could. So it will be in photography. Abolish the ounces, pints and drams, and use the gram and cubic centimeter (note the simplicity!), and an endless series of troubles will vanish from the developing, fixing and toning rooms. For we sincerely believe our present system of weights and measures to be the source of a hundred times as many mistakes as are possible in the metric system.

EDITORIAL NOTES.

THE officers of the Photographers' Association of America have just issued a very handsome souvenir of the semi-centennial at Boston, in the form of a pamphlet, which contains some excellent portraits of President McMichael, Vice-Presidents Hastings and Appleton, Secretary Scott and Treasurer Carlisle. It also contains the Constitution and By-Laws, an account of Daguerre and his work, rules for the Boston Exhibition, the official programme of the Semi-Centennial Proceedings, and much other valuable information for members. A very interesting section of the souvenir are the histories of the manufacturers of photographic supplies, and also of the American photographic journals. The whole affair is handsomely presented, and will, indeed, prove a fitting souvenir of the great jubilee at Boston.

A LIGHT sensitive compound has recently been prepared by M. Pechard. It is a mixture of oxalic and molybdic acids, and is called oxalomolybdic acid. It is a crystalline body, which when dry is not affected by light, but it turns blue under sunlight if it becomes moist. The solution is colorless, and writing may be made with it; but this rapidly turns blue in sunlight. By sensitizing paper with a saturated solution of the new compound and printing under a negative,

a very good impression in blue is obtained. But as soon as the paper is washed the blue image is destroyed; but if before moistening the print is heated for a few moments the impression turns gray and is permanent.

WE take great pleasure in noting the following in the *Journal of the Franklin Institute*: "Notice is hereby given that the Committee on Science and the Arts of the Franklin Institute has recommended the award of the John Scott legacy medal and premium to Dr. Richard Leach Maddox, of Southampton, Eng., for the 'Substitution of Gelatine for Collodion in Photography.'" We are glad that America has taken steps to honor the man to whose experiments the wonderful progress of modern photography is due; we congratulate Dr. Maddox on the honor conferred upon him; and heartily endorse the action taken by the Franklin Institute in selecting such an important discovery as the production of the gelatino-bromide emulsion as the object deserving the Scott Medal.

A NEAT method of backing plates with some black or non-actinic color was recently exhibited by Mr. Carter before the Photographic Club in London. Burnt sienna mixed with dextrine to a thick paste is applied to the back of the plates with a soft roller, like a printers' ink roller, or one used in roller copying presses often seen in offices. The rubber rollers used for mounting prints might serve for this purpose. In this manner a large number of plates can be readily backed with color, and if some alcohol is used in making the paste they will dry quickly.

WE note that Mr. Thomas Bolas, for many years editor of the *Photographic News*, has severed his connection with that journal, and has started another periodical, called the *Photographic Review*. At the close of his work upon the *News*, Mr. Bolas was entertained at a dinner by a number of prominent men in the photographic world in London. Mr. J. Traill Taylor presided, and among those present we note E. W. Foxlee, W. E. Debenham, William Bedford, F. A. Bridge, J. J. Briginshaw, E. Dunmore, Alexander Cowan and a number of others. On the same occasion attention was also called to the fact that our good friend, J. Traill Taylor, has just completed a quarter century's service as editor of the *British Journal of Photography*. We tender friend Taylor our hearty congratulations, and friend Bolas we wish every success on his new *Review*. The initial number of the new journal is before us and bids fair to be a decided success; it is terse, newsy and very much to the point. We make extracts from it on another page.

ENGLISH NOTES.

THE "International (Summer) Annual" met with a most gratifying reception there; 1,400 copies were sold in the first week, and the book will shortly be out of print. This is not to be wondered at, when we look at the list of one hundred and seventy-three contributors to Messrs. Anthony's splendid volume, and the nine illustrations by which this work is supplemented.

As a contrast to this I turn to a book which I picked up on a second-hand book stall the other day—"A Walking Tour in Brittany," by J. M. Jephson, F.S.A.—accompanied by "Notes of a Photographic Expedition," by Lovell Reeve, F.L.S. The preface is dated 1859, but the title page 1866. A little (and

completely faded) photograph forms the frontispiece ; but the book, when new, was accompanied by ninety "stereographs" in a box. Alas! those originally appertaining to my copy have gone astray, for they are *non est*. The link connecting this book with the new volume of the "Annual" is that H. D. Taylor (from whose veteran pen two interesting articles in the "Annual" proceed) was the professional photographer who accompanied Mr. Reeve, and who took the stereographs in question.

I earnestly hope that every reader of the BULLETIN tries to form a collection of books on photography. Of course every photographic society should aim at gathering together a large library on the subject ; but on the part of every earnest worker it will be found that a collection of one's own—to be always at hand—is necessary. It is the man who takes as his starting-point a knowledge of what others have done and are doing, who will be best able to advance photography in the future.

And this brings me to the splendid paper on "Allotropic Modifications of Silver," by Carey Lea, which has just appeared in the *American Journal of Art and Science*. A study of this masterpiece of research will show how Lea, in commencing to work at his subject, first read everything that had been published concerning it, and also repeated the experiments described by preceding workers. He was then able to distinguish the wheat from the chaff, and had laid a firm foundation for his work.

My own further work with hydroquinone has gone far to convince me of its advantages for the development of paper positives, but of its inferiority to pyro-ammonia for ordinary negative work. I find a yellow stain (of reduced silver) very apt to accompany hydroquinone development, and no treatment on earth (known to me) will remove that stain.

We are enjoying—for a wonder—a perfect English summer ; and the photographer's heart rejoiceth accordingly. But with this hot weather has come the usual crop of summer troubles, of which frilling during development is perhaps the most aggravating. To remedy this, a good proportion (say one-half) of methylated spirit should be added to the developer. When the image is fully out the plate should be well rinsed, and then soaked in an alum bath for a quarter of an hour.

The use of ice, to keep the temperature at or near 60 degrees, is a great advantage. The important point is to have all the solutions as near the same temperature as possible. It is the change from warm to cold liquids, or *vice versa*, which is the main cause of frilling. As a simple substitute for ice, I know of nothing better than nitrate of ammonia ; dissolve a handful of this salt in a pint of water contained in a large pie dish, and place your developing dish in it, and you will find the solution contained in the latter very effectively cooled. Even our "friend-foe," the familiar "hypo," will answer the same purpose, though not so well ; for the dissolving of its crystals produces—as every photographer must have noticed—a considerable degree of cold.

It is rather surprising that the lantern has hitherto had no paper—in English, at all events, for I believe there is the Italian *La Lanterna Magico*—devoted to its work. This deficiency is now supplied by *The Optical Magic Lantern Journal and Photographic Enlarger*, a magazine of popular science for the lecture-room and the domestic circle. Truly a portentous title ! This little periodical made its appearance on June 15th, and will continue to be published monthly at the Dor-

set Works, Salisbury Square, Fleet Street, London. The price is only one penny, and the editor is Mr. J. Hay Taylor, a son of the gentleman who presides over the *British Journal of Photography*.

Other changes are rife in the literary world. Mr. T. C. Hepworth relinquishes the direction of his monthly magazine, *The Camera*, in order to join Mr. Hastings in the conduct of the *Amateur Photographer*; while Mr. Bolas is succeeded (as editor of *Photographic News*) by Mr. W. H. Harrison.

There is a growing desire among the English photographic societies to make themselves of real service to the community. One way of doing this is to obtain a complete photographic record of the district surrounding the society's headquarters. The government maps covering the area in question are purchased, and all the points of special interest are marked on each map in red ink. To do this properly, the aid of the other scientific societies of the district (those interested in archæology, geology, etc.) are enlisted, or specialists are appealed to. The photographers willing to take part in the work then group themselves in pairs—each selecting his bosom friend, of course—and to each pair one sheet of the map is allotted; and it becomes the duty of each couple to obtain two good negatives of each point marked on their map. The negatives are then all reproduced so as to be on one scale (whole-plate or 10 x 8, I recommend); and half a dozen platinotype prints and three lantern slides are made from each. Finally, the prints are made up into sets and pasted in albums, one set being retained by the society, and the others placed in the public libraries and museums of the district.

Just fancy the value and interest of such a photographic record in the future! What would we not give for "sun-records" of New York in the days of Hudson, or of the Puritans when they landed from the "Mayflower"? But the times in which we live will be "ancient history" some day; and our descendants will blame us—and blame rightly—if we do not avail ourselves of the powers which we now possess to bequeath to them a record of such immense interest. There is no special need of any "society" to do this work. Let every individual worker set his hand to the plow and resolve to do his part in this great work.

Tests which have recently been made of a large number of shutters failed to find one which gave a satisfactory exposure of less than the seventieth part of a second, although far more than this was claimed for many of the shutters by their inventors. As a matter of fact, it is best to carry *two* shutters. One of these may replace the ordinary lens cap, and should be capable of giving time exposures, or anything down to, say, the tenth part of a second. Such a shutter is made very cheaply by J. Place, of Bull street, Birmingham, and I invariably carry it in lieu of a lens cap. For really rapid work we want a second shutter which shall be capable of giving graduated exposures from one-thirtieth to one-three-hundredth part of a second. As far as my experience goes, such a shutter has yet to be made; or at all events, to be perfected. Attempts are now being made to produce this ideal shutter—which, however, must have other qualities in addition to mere quickness—and I hope to be able to shortly announce a success.

The Annual Convention of British Photographers—both professional and amateur—will this year be held in London during the week commencing August 19th, under the presidency of the Scottish amateur, Mr. Andrew Pringle. The St. James' Hall, a large edifice in Piccadilly, has been engaged for the week, and

it will contain a large show of apparatus. There will be evening meetings for the discussion of papers, and afternoon and whole-day excursions to places of interest in the neighborhood of the metropolis. Among those who mean "to be there," you may include

TALBOT ARCHER.

PHOTOGRAPHIC CHEMISTRY IN OUTLINE.

BY HUGH MARSHALL, B.SC., F.R.S.E.

[Read before Edinburgh Photographic Society.]

THAT a knowledge of chemistry is of considerable use to a photographer need hardly be insisted upon. The majority of photographic operations are more or less of a chemical nature, and it is indisputably a fact that the more a person understands the nature of the operations in which he is engaged, the better will he be able to perform these, and will be better able to cope with unexpected difficulties and exceptional cases when they arise. To the studio photographer these considerations do not apply so much as to those of their brethren who go in for landscape and out-of-door work generally. The former is working regularly under nearly the same conditions, and can, as a rule, repeat his exposures until he obtains a satisfactory result by his ordinary mode of working; the latter, on the other hand, has the most varying conditions to contend with, and very often finds himself so placed that he cannot secure another "shot," and must therefore look to the after-treatment of his plate to make up as far as possible for any error in his exposure. It is in the latter case that chemical knowledge proves such a help.

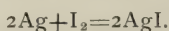
It would require a regular course of lectures or papers to do anything like justice to the subject, so here it is possible only to touch on the outstanding points which come into the course of ordinary work, and leave out of consideration altogether points on which it is possible only to conjecture.

The first thing to which we naturally turn is a consideration of the compounds of silver, which not only play the most important part in photographic operations, but on whose reactions nearly every photographic process is entirely dependent.

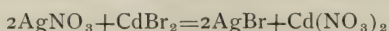
The starting point for the preparation of the sensitive compounds is silver nitrate, lunar caustic. This is formed by dissolving metallic silver in nitric acid and obtained pure by crystallization. It is a white crystalline substance, fusible, and easily soluble in water. In contact with organic matters this solution is decomposed, metallic silver being deposited. It, as silver compounds generally, is blackened by the action of sulphureted hydrogen, due to the formation of silver sulphide. For this reason silver salts, as well as sensitive plates and papers, should be kept in air-tight packages.

If we take a solution of silver nitrate and add to it a solution of a soluble chloride, say common salt, we find that a white precipitate is formed. This is due to the fact that chloride of silver is a white insoluble substance, and we have it formed here by "double decomposition," *i. e.*, the metals change places with one another. In the same way we can obtain silver bromide and iodide by substituting for the soluble chloride a solution of bromide and iodide respectively. These three salts may be collectively spoken of as the haloid salts of silver—chlorine, bromine, iodine (and fluorine) forming the group of elements known as the halogens. These haloid salts of silver present many similarities, but also

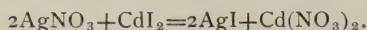
many differences in their chemical behavior. They are insoluble in water and dilute acids. They darken on exposure to light, with loss of halogen, especially if any nitrate of silver be present. In color they vary somewhat, the chloride being white, the bromide pale yellow, and the iodide a slightly deeper tint. They are all attacked by ammonia forming "amido" compounds. That from the chloride dissolves readily, that from the bromide more slowly, while that from the iodide is insoluble. They all dissolve in solutions of thiosulphate of sodium, potassium cyanide, and the corresponding alkaline haloids. In the daguerreotype process the sensitive salt was not produced by double decomposition as above, but by direct union, a plate of metallic silver being exposed to the action of iodine vapor.



In the wet plate process the soluble haloid is dissolved in the collodion, and therefore salts must be employed which are soluble in a mixture of alcohol and ether. Hence one reason for the employment of cadmium bromide and iodide. The plate coated with collodion is then immersed in a bath of silver nitrate solution, when we get the silver haloids deposited in the film, which then also contains, in addition, soluble cadmium and silver nitrates.

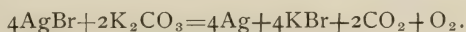


and



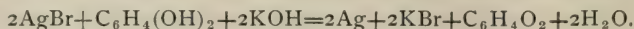
In every chemical reaction a definite invariable quantity of one reagent is required for a given quantity of another. Hence after all the soluble haloid has been changed to silver haloid, any further quantity of silver nitrate taken up by the film remains as such. This plays an important part in the development of a wet plate. We must turn our attention, however, to the gelatine dry plate as being that with which we all work in every-day practice. The outstanding difference between this and a wet plate, beyond that of the medium containing the sensitive salts, is, that here these salts are formed in a separate vessel and then transferred to the plate, and that all soluble salts have to be carefully removed. The process is roughly as follows: Gelatine is soaked and dissolved in a solution of haloid salt, and to this, in the dark, is added a solution of silver nitrate, barely sufficient for all the halogen present, when the sensitive silver salts are formed. The emulsion is then allowed to set, cut up into pieces, and washed. A more sensitive emulsion is got by "cooking" or by the ammonia process. In this latter the silver nitrate is converted into an amido salt by the addition of ammonia solution till the precipitate first formed is dissolved. This solution is used similarly to the plain silver nitrate solution above mentioned. The emulsion after washing is made fluid by heat, the plates are then coated with this, allowed to set, and dried. When such a plate is exposed to light, an action takes place, and we get a latent image produced. What the precise action is has yet to be demonstrated. Several theories have been advanced, but into these it is not our province to enter here. What we do know is, that by means of certain substances we can convert this latent image into one composed of metallic silver, in which, if the exposure has been correct, the relative density of one part is proportional to the relative intensity of the light at that place. This is the process of development, and we call the reagent by which it is accomplished, a developer. All developers have one chemical property in common. They are reducing agents or abstractors of oxygen. In the process of develop-

ment, however, it is bromine or iodine that we wish to remove, and this a developer will also do, directly or indirectly. The commonest developing agent in this country is pyrogallic acid, or pyrogallol, to give it a more proper designation. This is an "aromatic" compound, being benzene with three of its carbon atoms oxidized. It is not an acid, but derives its name from the fact that it is obtained by heating gallic acid. In alkaline solution it rapidly darkens, taking up oxygen and decomposing into various substances, among which are some not yet isolated dark coloring matters or matter. Such a solution is used in chemical work, as in gas analysis, to absorb free oxygen. It will also abstract halogen from silver haloid in the latent image, alkaline haloid being formed.

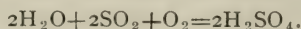


This oxygen goes to oxidize the pyrogallol, and it is this reducing property which makes the reaction work, as potassium carbonate alone has no effect on haloid salts of silver. The kind of alkali used has a considerable bearing upon the question of density and detail. Thus, mass for mass, sodium carbonate acts more energetically than potassium carbonate, and the caustic alkalis act still more powerfully. When ammonia is the alkali used, another consideration creeps in. Those aforementioned have no action on the silver haloid by themselves. Ammonia, as was previously stated, has. It converts silver bromide and chloride into soluble compounds. Now, silver compounds in solution are decomposed immediately by developing agents. Therefore, if we take a developer which contains an excess of free ammonia, we have such a solution formed all through the film. This is immediately reduced to metallic silver, and "chemical fog" is the result. The action of a soluble bromide as a "restrainer" in a developer is not quite understood. There is one point, however, on which it is important to say a word with reference to the bromide used. In an ammonia developer either potassium or ammonium bromide may be used, slightly different proportions being taken. Where potash or soda is used, however, ammonium bromide is inadmissible, as it undergoes double decomposition with the alkali present, ammonium carbonate, and, from this, free ammonia being formed. That this is so can easily be proved by mixing moderately strong solutions of, say, potassium carbonate and ammonium bromide, when the presence of free ammonia becomes evident to the sense of smell. Hence, the use of the ammonium salt in such a developer would bring about an effect just the opposite of what was intended. Pyrogallol, as a developing agent, has of late been, to a certain extent, replaced by a somewhat nearly related substance—hydroquinone or quinol. This is di-hydroxy-benzene containing an atom of oxygen less than pyrogallol. Hydroquinone is a white crystalline substance soluble in water and in alcohol. It forms a definite compound with sulphurous acid. Commercially, it is prepared from aniline. At present it is dearer than pyro, in this country at least. An increased demand, however, would soon make a difference in this respect. In the name quinol, as in pyrogallol, the termination *ol* is used to indicate the relations of these bodies as hydroxy-benzenes, phenol (carbolic acid) being the simplest type of the class. There are two other bodies of the same composition, and these also have a similar developing action. Like pyrogallol, it acts only in alkaline solution. A fixed alkali is used in this case, as ammonia itself acts on the hydroquinone. The action of hydroquinone is somewhat different to that of pyrogallol. It simply loses hydrogen, and is converted into a

nearly colorless substance called quinone, and so we have no discoloration, as with pyro.



The addition of sulphurous acid or alkaline sulphites as préservatives to solutions of pyro and hydroquinone is not uncommon. These act by absorbing any free oxygen which may be taken up by the solution being turned into sulphates.



A solution of pyro which has been made slightly acid also keeps better than a plain one, as then it has not the same tendency to take up oxygen as it has when neutral or alkaline.

(To be continued.)

[From Photographisches Archiv.]

EXPERIMENTS WITH NEW COPYING PAPERS.

BY DR. J. SCHNAUSS.

I.—*Chloride of Silver Gelatine Paper, with Development.*

I have had paper of this kind from several manufacturers, even from the United States. Although the developing formulas differ somewhat in their proportions and additions, the process is alike in the following main points, which have to be observed to secure success.

The time of exposure should not be too short, if warm tones and generally fine modulated copies are to be obtained. The strength of the negative is of course a main consideration, and it should be neither too hard nor too weak. A good negative, even if slightly fogged, as most gelatine negatives are, should be exposed at the most from six to eight seconds in diffused daylight, behind a closed window. (In some formulas the time is given from thirty to sixty seconds, which is much too long, and I thus always obtained totally burned pictures.) In the light of a 14-line kerosene lamp, placed pretty near by, the negative requires from seven to eight minutes, to make a good copy.

The developer, whether oxalate of iron or hydroquinone, should not be too fresh, and obtains mostly as addition an organic acid, acetic, citric or tartaric acid. The proportion between oxalate of potassium and sulphate of iron—provided they are concentrated solutions—should not be more than 6 to 1—that is, the potassium salt should weigh so much more, as otherwise it will precipitate a great quantity of oxalate of iron and soil the copies, particularly if the mixture is subsequently diluted. To render this evil harmless (although it can be most thoroughly avoided by applying hydroquinone) the copies should be put into a citric or acetic acid bath, diluted with water, or the acid is at once added to the necessary alum bath. The very thin gelatine film is very easily damaged and requires tanning.

The most important point yet is the toning process, which offers a little more difficulty than with regular prints. Fortunately there is no necessity of extra care with regard to the illumination of the dark room during development of these pictures; a candle with an orange colored chimney will do no harm, if the dish and the picture in the same during the developing and toning process are not held against the light more than a few seconds. The toning process can be observed a great deal better in this light than in the ruby light. The com-

bined sulpho-cyanide—soda—gold bath has given the best service to me, but the pictures have to remain in the same quite a long while.

All work must be done with the utmost cleanliness, particularly in the application of hydroquinone, the least trace of soda producing large black spots. The pictures should, therefore, always be taken hold of in the several baths with a pair of wooden pincers, constructed for the purpose, or help should be employed. Squeegeed upon waxed glass or ebonite, the developed chloride of silver gelatine pictures will assume a pretty gloss, but not as much as the aristo gelatine paper, which may be due to the very thin film.

II.—*Chloride of Silver Collodion Paper.*

The photographer, Wothly, in Aachen, a very clever artist, was, as far as I know, the first one to apply collodion to the preparation of a direct copying (uranium) paper; I was not a little astonished to prove the presence of collodion after having made an analysis of this paper at the request of Mr. Van Monckhoven and Mr. Wothly. But the excellent proportions of the collodion paper showed first in the form of an emulsion of chloride of silver, wherein it is equaled only by the chloride of silver gelatine paper (aristo), and even surpassed it in convenient handling, because this appears during the different manipulations, as soon as it has become wet, to be pretty tender, and has a decided inclination to curl, particularly when the base paper is pretty thick. It should be very carefully handled in a moist condition, the collodion film being easily damaged, particularly around the edges. These small defects of the chloride of silver collodion paper are over-balanced by extreme sharpness of the pictures produced on the same, particularly in comparison with albumen paper, where the details in the deepest shadows are not visible.

It tones extremely quickly, compared even with the prints upon gelatine paper, if toned together in the combined tone-fixing bath; but enough care cannot be had not to lose the handsome purple tone of the collodion paper by the rapidly following bluish-black.

I have entirely given up the pasting of these pictures, particularly the gelatine paper, in a moist condition, and do not advise pasting the gelatine paper with a warm glue solution, the gelatine film being thus softened and getting very sticky, causing great trouble to finish the picture without damaging it. From my experience I should say that a dry and flat picture can be pasted best with cold, evenly made, thin paste of rice starch.

In this way even the most glossy aristo pictures can be pasted without disadvantage, as also those made on chloride of silver collodion paper. Albumen paper prints, on the contrary, should always be pasted in a moist condition, and once dried in the air, even the subsequent immersion in water will not prevent the numerous fine cracks, which, particularly on double albumenized paper, cover the whole surface of the picture and deface the same.

[From the *Photographic Review*.]

MR. W. H. HARRISON'S EXPERIENCE IN TAKING "AT HOME" PORTRAITS AND GROUPS.

MR. HARRISON, who has had special and extensive experience in the above mentioned class of work, has been good enough to give us an article dealing with the subject. Professional photographers and amateurs will both be interested. Mr. Harrison writes:

There are persons who tell us that photography is doomed; that since it has become so universally practiced, and so generally utilized for commercial purposes, it has also become common and degraded. They talk with fervor of the palmy days, now, alas! (so they would have us believe) gone forever. As an illustration they remind us of the fact that we can now get a cabinet portrait, "satisfaction guaranteed, Parisian finish," etc., etc., for the small sum of one shilling; or, to further illustrate the degradation to which our art has fallen, call attention to Boudoir photos, used for advertising cigarettes, or to automatic machines for the delivery of penny portraits of celebrities. And so they run on, comparing the past with the present, to the detriment of the latter, "almost make us waver in our faith," and hold opinion with them. Let us not, however, be too ready to despair; there appear signs of a brighter future. While the demand for old styles and antiquated forms is becoming smaller by degrees, other fields for enterprise are opening up. To the intelligent, thorough and observant worker, photography presents an almost unlimited field, and the law of the "survival of the fittest" is yearly elevating such; while those who do not prove themselves worthy the appellation, will in time find their own level.

One important departure from the old lines is the photographing of persons in other than the regularly appointed glass house.

There are many reasons why this "At Home" work should be cultivated; and first I notice that he who makes it a *spécialité* frequently obtains commissions which would otherwise be withheld. How convenient, after a fancy ball, for instance, to be able to call in a photographer, without the necessity of sending a whole wardrobe and a servant to the studio. Nor must we forget that there are many who are too infirm, either from age or suffering, to visit us at the studio without great inconvenience, and sometimes serious risk to health. The friends of such are particularly anxious to have life-like and unconstrained portraits of them. They, of course, seek a photographer who is successful with drawing-room work, and has a reputation for the same.

Amongst the numerous sitters patronizing a large photographic studio we occasionally meet with ladies who, unfortunately for themselves and all concerned, suffer from irascibility of temper, and when the subject is "fair to see," a large amount of vanity often adds to the complication. The class of people who snub the poor photographer because the day happens to be hot, or the clouds prophesy a shower, speak of the reception-room attendant as "that girl down-stairs," and the operator as "that man up-stairs"; are tardy over their toilet, grumbling the while; impatient at the studio, and highly indignant with the photographer when it is hinted that it is the custom of the profession to receive payment or at least a deposit at the time of sitting.

To such what could be more annoying than to see in the show-case, say a month afterward, portraits of their kitchen-maid, parlor-maid or nurse-girl, posed familiarly, lighted in a way that bespeaks imitation, and with the self-same background and accessories with which her own angelic figure was surrounded! If the photographing of such people at their own homes, with their own articles of furniture and ornamentation, be proved by results to be practicable and recommended by us to our sitters, surely it would be to our advantage.

Photography and conventionality are looked upon by many artists as inseparable.

able, and the conduct of many has done much to merit the reproach. Be it ours to wipe away the stigma, and prove that the camera may as surely as the brush be instrumental in art production and art advancement.

And now, to address myself to those who are about to take up this work, let me say, that if any of the suggestions I may make prove of service to them, they are welcome to them; if not, I must reproach myself for having wasted so much valuable space, and crave pardon.

There are many difficulties in this work which do not present themselves in the ordinary glass room or studio. I need scarcely say that one of the greatest is the scarcity of light, and not only the scarcity, but also the directness with which it enters the apartment, coming generally from one or two small windows. If, in order to get sufficient light, we find it necessary to place the sitter near the window, then the effect is hard in the extreme. Shadows black as ink, with never a bit of detail visible. It is well to place the sitter back if there be room, so that the light enters the apartment in front of the face, thus modifying the contrasts a little. The windows are generally found profusely draped with curtains, often of a thick material, admitting little or no light. Even when they are of lace it is quite common to find them so deeply dyed with saffron that the light which does struggle through possesses little actinic power. By all means have them pinned well back to the sides of the window. Our patroness may demur when she sees what we are about, but if we explain the necessity of the proceeding and give her the assurance that we will exercise great care in our preparations, she will soon be won over.

Having now a strong light and dark shadows, we must resort to reflectors; and for this purpose I have found nothing better than an ordinary bed sheet. This should be very carefully placed, not too far back, so that the reflected light, as well as the direct, may come pretty well from the front.

A portable stand for supporting the reflector may be easily made out of a few feet of round deal about an inch in diameter, cut into suitable lengths, and joined by means of ferrules as used for fishing rods.

The end supports should appear like the letter V inverted, with a rod of the same material along the top, either end of which rests on these end supports. The sheet can be thrown over this stand in the same fashion as the washerwoman has previously placed it on the clothes line to dry. In fact, our reflector-stand is little more than a portable clothes-horse; yet it will be found of great service. If we are not supplied with some such article, we often experience a difficulty in attaching the corners of the sheet in a suitable position. Of course this arrangement can be moved to any part of the room when required. A similar contrivance is useful for placing a plain background when vignettes are required; the wall paper often being unsuitable for that purpose.

The reflector sheet should be of ample size, so that it may be spread out on the floor, as well as placed upright on the stand.

Where the window is very small and the general tone of the room dark, additional light may be gained by placing a large reflector outside the window. We have all noticed the effect in our rooms, when the ground and surrounding buildings have been covered by a layer of snow. How it fills the apartment with light! In a lesser degree we may gain the same effect by the use of an outside reflector.

(To be continued.)

[From *Photographisches Archiv.*]**THE APPLICATION OF SULPHITE OF SODA DURING DEVELOPING.**

BY PAUL POIRÉ.

THE analysis of many kinds of sulphite of soda, sold as chemically pure, has shown that this substance contains always some carbonate of soda. I have worked with specially prepared sulphite of soda containing no trace of carbonate of soda. 100 c.c. of a 25 per cent. solution of this salt, dissolved with $1\frac{1}{2}$ grm. pyrogallic acid, developed the picture, under normal conditions of course, slower than the salt in the market or a bath to which carbonate of soda had been added; in course of time, every desired density can be obtained.

This developer will never produce the fog which settles generally upon plates of too short exposure and too long development.

Negatives made in extremely bad light have been in this bath from eight to nine hours without fogging or peeling off. The bath can be employed several times, and in well corked bottles it will keep for a long time. I have kept a solution in which eight to ten plates had already been developed for five months. It hardly has discolored and worked as good as when fresh.

These experiments show that the above mentioned proportions are the best, and that carbonate of soda should only be added if the development proceeds too slowly.

[From *The Photographic News.*]**THE FORM AND APPLICATION OF SINGLE LANDSCAPE LENSES.**

BY T. R. DALLMEYER, F.R.A.S.

[A Communication to the Photographic Society of Great Britain.]

IT is not my intention to trace historically the development of modern forms of single landscape lenses, but to indicate how far they can fulfill the various purposes for which they are designed.

The following considerations are involved: 1. Rapidity. 2. Corrections, centrally and excentrically, consistent with definition. 3. The amount of angle included. 4. Distortion. 5. Curvature of field. 6. Brilliancy and freedom from flare spot.

I shall refer to four forms that I construct myself, but the general treatment of these will, I hope, cover the ground sufficiently to aid those who wish to carefully investigate the properties of the instruments in their possession, and the purposes to which they are best applied.

It is the number of considerations to be borne in mind in the construction of a single landscape lens, some of which are at variance to others, that renders its construction of the same rapidity as a double combination an impossibility; but the brilliancy of image given by single combination lenses has made them perhaps the most popular form with photographers generally, where they can be employed. If the central pencil only had to be considered, a single lens can be made, of course, of a very high intensity, $\frac{1}{4}$, and even quicker; but only a degree or two from the axis all definition is gone.

The compromise then begins; how large an aperture can be employed consistent with good marginal definition, etc. Fig. 1 represents the simplest form of single combination, known as the "Wilsonian." It consists of a plano-concave flint, cemented to a double convex crown, and is successfully constructed

for lenses up to 8 inches focus, working at an intensity $\frac{f}{10}$, entirely free from spherical aberration. For reasons subsequently to be explained, this form is not to be recommended for larger lenses. Fig. 2 represents the triple meniscus, introduced in 1867, and known as the wide angle landscape lens. Fig. 3 is the rapid landscape specially constructed to work at longer foci than the former on given sizes of plates, and about double the rapidity without spherical aberration. Fig. 4, the new rectilinear landscape lens, I introduced last year, intermediate between the two former in point of rapidity, possessing certain distinct advantages over the others, and the theoretical disadvantage from the open air space between the corrector and the single posterior lens that forms the image. This I shall refer to later. I have prepared a table having reference to the figures in the points of investigation referred to at first.

I will now treat of the six heads in the table; but before doing so will describe a simple means for examining the lenses to be critically tested in these respects. Concentric with the axis of the lens, and about ten to fifteen times its focal distance, place a naked lamp-flame of small size, and near to it the bulb of a thermometer filled with mercury, so that the small bulb is visible closely adjacent to, but a little behind and to the right and left of the flame. The image reflected by the bulb of the lamp-flame acts very well as an artificial star or point of light. When the lens is screwed into the camera, and then focused upon the lamp, you can tell if all is properly centered by removing the focusing screen and viewing the reflected image or images visible, and if all are seen in a straight line and in one plane, then you are sure of having all true to view the central pencil. It is also an advantage to have a small scale behind the lamp-flame, with various graduations and figures, as an additional guide to the defining power. An illuminated bright cross is also a valuable test object for judging the correction for astigmatism. I assume in the table the lens to be actinic—viz., that the chemical and visual foci are coincident; and as this test has often been explained, I shall not enter upon it now, although it is of course of first importance that lenses are perfectly corrected in this respect.

1. *Rapidity or Intensity free from Spherical Aberration.*—The test for freedom from spherical aberration is in plain language that the lens gives a *sharp image*. On focusing the lamp-flame and artificial star sharply, and slightly wheeling the screen in and out of focus, the structure of the image should vanish equally on both sides of the focus. If a sharp image cannot be obtained, but an image with a woolly halo round it, there is aberration present; on wheeling the screen inside the best focus the image will at once disappear, but on wheeling it outside the structure of the image will linger more or less, according to the amount of positive spherical aberration present. To judge fairly of the true power of a lens in this respect (even for the central pencil), smaller and smaller stops should be introduced until the definition is such that spherical aberration is not present—the ratio of this diameter to the equivalent focus of the lens is then the true measure of its intensity for the central pencil and the gauge of its rapidity. It is distinctly misleading to claim for a lens an intensity other than that at which spherical aberration is eliminated. The advantages that accrue from the introduction of spherical aberration, when measurable and reproducible to obtain soft images, are generally acknowledged, and it is then advisable to allow single combination lenses to have a *larger* aperture than eliminates all positive spherical aberration for certain purposes, so long as the structure of the image is not de-

stroyed; but I maintain that the basis on which to register the true intensity of a lens is that at which no aberration is present. I have clearly demonstrated, in a discussion that occurred in the *Photographic News*, how positive spherical aberration assists in producing softer definition, and how the definition of planes more distant than that focused for gives "depth of focus." Single rapid landscape lenses

Style of Lens.	Intensity (free from uncorrected aberration). (1)	Quality of correction of eccentric pencil. (2)	Angle included for parallel rays.	Distortion.	Curvature of field. (3)	Brilliance and flare spot. (4)
Fig. 1. Single Stereo Lens Focus, 6 inches	$F \frac{1}{10}$	Appreciable astigmatism at extreme edges of plate more pronounced than in Figs. 2 and 3.	Extreme angle = 71° . Angle included on base line of 5×4 plate = 45° .	Measurable at margins of full covering power.	Very flat; can hardly be measured.	No trace of flare spot. Equal illumination over 35° (full aperture).
Fig. 2. Wide Angle Landscape Lens. Focus, 10 inches. Plate, 10×8 inches.	$F \frac{1}{15}$	Slight astigmatism combined with coma out of extreme edges.	Extreme angle = 77° . Angle on base line of 10×8 plate = 53° .	Measurable and visible to eye at extreme edge of plate.	Not measurable, or hardly so.	No flare spot. Equal illumination over 50° (full aperture).
Fig. 3. Rapid Long-Focus Landscape Lens. Focus, 15 inches. Plate, 10×8 inches.	$F \frac{1}{11}$	Slight astigmatism and trifle more coma out than above (Fig. 2).	Extreme angle = 65° . Angle on base line of 10×8 plate = 36° .	Can be measured with straight edge, but hardly appreciated by eye on 8×10 plate.	Measurable, about $\frac{1}{10}$ inch at edge of plate.	No flare spot. Equal illumination over 22° (full aperture).
Fig. 4. New Rectilinear Landscape Lens. Focus, $13\frac{1}{2}$ inches. Plate, 10×8 inches.	$F \frac{1}{13}$	Almost free from coma at extreme edges of plate and no astigmatism.	Extreme angle = 68° . Angle on base line of 10×8 plate = 40° .	None.	Measurable and slightly more than above.	No flare spot. Equal illumination over 25° (full aperture).

(1). Can be used with larger apertures, introducing positive spherical aberration, giving softness to image.

(2) and (3). The use of smaller stops benefits both.

(4). By employing smaller stops, perfectly equal illumination can be given to the whole plate.

are now considerably in vogue among amateurs for portraiture, and an extra large aperture, having a certain amount of positive spherical aberration outstanding, produces the soft pictures so much admired by many. I wish to lay particular stress in this paper on what I term the rendering in the image of *true structure*, and the bearing of the introduction of positive spherical aberration

consistent throughout the whole image, where soft pictures or *impressions* are wanted (I refer to the excentrical as well as the central pencils), is distinctly and undeniably advantageous for planes in the object beyond those focused for.

(*To be continued.*)

[From the *British Journal of Photography*]

PHOTO-MICROGRAPHY.

BY ADOLPH SCHULTZE, F. R. S. E., F. R. M. S.

[A Communication to the Glasgow Photographic Society.]

PHOTOGRAPHY has become the handmaid of many arts and sciences, and of none more so than microscopy, which itself has of late been raised to the rank of a distinct science. The art of photographing the image of a microscopic object, which image has been enlarged by the microscope, is called by the un-euphonious name of "Photo-micrography," in contradistinction to "Micro-photography," which name has been given by common consent to the art of producing microscopic photographs of large objects, which microscopic photographs require the aid of a microscope to render their details visible. Photo-micrography has probably been practiced since photography received its practical application. No one who has used a microscope can have escaped the desire to keep permanent records of the wonders it reveals. Dr. J. W. Draper, of New York, is supposed to have been the first to take a photo-micrograph by the daguerreotype process, as he was also the first to take portraits by this method. Mr. Dancer, of Manchester, produced, about 1840, photographs by the aid of the oxyhydrogen lantern microscope. In 1841 Mr. Richard Hodgson obtained excellent daguerreotypes of microscopic objects, and the Rev. J. B. Reade and the Rev. Charles Kingsley, as well as Mr. Talbot, also devoted their attention to the subject in question at an early stage. Dr. Donné, of Paris, presented, in 1840, to the Academy of Sciences copies of photographs of various microscopic objects on daguerreotype plates, and in 1845, as Moitessier tells us, Dr. Donné "*publiait avec Monsieur Léon Foucault un magnifique atlas relatif à l'étude des fluides de l'économie et contenant un grand nombre de figures gravées d'après des images daguerriennes.*"

In this country one of the earliest publications on the subject of photo-micrography was a paper presented to the Microscopical Society in 1852 by Mr. Joseph Delves, which was followed by some beautiful prints taken from his collodion negatives, which were issued with the following number of the *Quarterly Journal of Microscopical Science*. The short time at my disposal this evening does not permit me to enter further into the history of my subject, and I will confine myself to mentioning the names of some of the principal workers in the domain of photo-micrography. These are Messrs. Shadbolt, Highley, F. H. Wenham, Dr. Maddox, the inventor of the gelatino-bromide dry plates; Barry, Davies, Dr. Wilson, Dr. Abercrombie, Dr. Herapath, George E. Davis, Dr. E. M. Crookshanks, J. Mayall, Jr., E. M. Nelson, and many others. In France we have, besides Donné and Moitessier already mentioned, Foucault, Dubosq, Dr. Miguel, Bertsch, Roux, the assistant of Pasteur, etc.; in Germany, Gerlach, Albert, Mayer, Reichardt, Pohl, Siebert, Dr. Koch, Dr. Roderich Zeiss, Professor Cohen, Reinsch, and many biologists and physiologists of the present day; in Belgium, Neyt, and, in recent times, Dr. Van Heurck, Director

of the Botanic Gardens in Antwerp; in Italy, the Abbé Count Castracane; and last, but not least, in the United States of America, Rood, Draper, Fowler, Crehore, Dean Rutherford, Seiler, Mercer, Dr. Sternberg, Colonel Woodward, and Dr. Curties, of whom the latter stand pre-eminent as masters of photo-micrography. The number of those practicing this art to-day has probably to be counted by thousands.

The object of photo-micrography is to produce a faithful photograph of the enlarged image of a microscopic object, which shall not only show everything apart from color that we can see in the microscope, but even more. The microscopical image can also be drawn by means of a *camera lucida*, but this process requires a great deal of time and a hand skilled in the use of the pencil. Frequently, however, we are unable to delineate the image in this way, owing to rapid changes in the constitution and the shape of the object under observation. A drawing is, moreover, always open to the objection that the draughtsman may not have copied faithfully, and may have drawn upon his imagination. From this reason retouching is not permissible in photo-micrography. The negative must remain unretouched; intensification or reduction of density are the only changes which, in some circumstances, may be made in the negative. The importance of photo-micrography is obvious, as it is the most reliable and easy means of making faithful records of the appearances and measurements of microscopic objects, be it for the illustration of scientific books or for lantern slides to illustrate lectures, or for supplying evidence in law courts in cases of adulteration, forgery, murder, etc. In the domains of botany, biology, physiology, pathology, bacteriology, chemistry, petrology, etc., in fact, wherever the microscope is used, there photo-micrography is destined to become daily of more service and importance. It is also an agreeable and useful pastime to the possessor of a microscope and of a camera, and can be practiced independently of the weather and of the light of day, for even at night plates may be exposed and wasted to satisfy the most enthusiastic amateur. As a means of practicing the virtues of patience and perseverance, photo-micrography is, in my humble opinion, almost unsurpassed, for endless are the failures and troubles which the beginner in this branch of our black art will have to encounter. There are the difficulties of finding suitable objects; of their correct illumination; of suitable objectives; of equal illumination of the plate; of obtaining the correct chemical focus; of correct exposures, varying from a fraction of a second to several hours; the chances of vibrations during exposures over which the photo-micrographer has no control; the difficulties of development and of printing, and so on. Owing, however, to many important improvements in microscopical lenses and apparatus, as well as to the greater perfection and sensitiveness of the dry plates, and thanks, also, to the experience of those who have practiced photo-micrography for years, and of whose experience the younger disciples are reaping the benefit, photo-micrography is now very much easier than it was even five years ago, and, indeed, it may be said that when practiced with low and medium powers offers few difficulties, if any.

The *modus operandi* of taking a photo-micrograph consists chiefly in the following operations:

1. Focusing and illuminating the object in much the same way as for visual examination.
2. Connecting the eyepiece end of the microscope with the camera.

3. Focusing the image on the focusing screen.
4. Replacing the latter by the carrier containing the sensitive plate, and making the exposure.
5. Developing the negative.

Many articles on photo-micrography have appeared, chiefly in photographic publications, which really do not contain more information on the subject than what I have just enumerated. In the February number of a quasi-scientific journal appeared again one of those shallow articles, in which the writer of it stated that he was greatly pleased and astonished that he had succeeded in producing at once some passable photo-micrographs.

To command success in photo-micrography requires not only the possession of a good microscopical apparatus and camera, but also an intimate acquaintance with the principles of microscopical illumination of photography.

(To be continued.)

[From the Philadelphia Public Ledger, July 24, 1889.]

THAT "PHOTOGRAPHIC TRUST"—IT IS NOT A "TRUST," BUT "A SECRET ORDER."

PHILADELPHIA PORTRAIT PHOTOGRAPHERS BEING URGED TO JOIN—OPINIONS.

PRO AND CON—THE COMING CONFERENCE AT BOSTON.

DURING the past two weeks agents have been visiting the Philadelphia portrait photographers, soliciting them to become members of the Photographers' and Artists' Mutual Beneficial Association, a secret organization about which there has recently been a great deal of talk in the various photographic journals. That those agents have met with some success is evident, from the fact that several leading photographers confess membership in the movement, but others who have been approached have declined to have anything to do with it. For instance, of four leading Chestnut street studios, whose proprietors were questioned yesterday, two are represented in the association and two are not. One of the former said that he had not seen any of his fellow-photographers about the matter, but had been told by the association's agents, who initiated him, that a large proportion of the Philadelphia members of the profession had gone in. The effort is being made to include in the association all the photographers of the United States, and much work has yet to be done. It is said that the work of organizing New York City has hardly yet been begun, and that many other prominent points have not yet been touched. The projectors of the movement—the secrecy of which and the statements made as to its proposed methods have led to its being spoken of as a "Trust"—are said to be waiting for the convention of the Photographers' Association of America, which is to be in session in Boston from the 8th to the 10th of August. Photographers from all over the country are expected to be there, and the officers of the "P. and A. M. B. A." expect to get all their friends together and talk over the plans for the future.

WHAT IS HOPED TO BE ACCOMPLISHED.

The association was organized some months ago and is incorporated under the laws of the State of New York, its chief officers being : President, Abraham Bogardus, of New York ; Secretary, F. E. Cady, of Auburn, N. Y. ; Treasurer, Philip S. Ryder, Syracuse, N. Y. ; and General Manager of the Traveling Agents, N. B. Thayer, of Auburn. Its objects are thus summarized :

1. To stop ruinous cutting in price.
2. To establish a higher and more equitable scale of prices.
3. To secure enough compensation to the photographer to enable him to do first-class work.
4. To oblige parties to serve a three years' apprenticeship, and to have a certificate of service from a master before being qualified to engage in the profession.
5. To organize a bureau of information for the employer who wishes help, and for the employee wishing a position—their standing in all respects to be supplied.
6. To organize a secret service for the quick assistance of membership.

WHAT SOME OF THE MEMBERS SAY.

A variety of opinion has been expressed as to the practicability of the movement, even by those who have joined it. Mr. F. Gutekunst, whose name has been used extensively as an inducement to others to join, said to a *Public Ledger* representative: "I agreed to join this association upon the assurance that its object was to elevate and improve the profession, and to stop ruinous rate cutting. I do not see how the latter can be done, but I am willing to help it if it can be accomplished. I do not like the secret feature of the movement; and if the talk I have heard about 'trust movements,' etc., proves to be true, I shall very promptly withdraw." Mr. Gutekunst added that, as he knew so little about what the association meant to do, he had refused to write a letter stating that he was a member, but would await developments.

Another member, a well known Chestnut street photographer, said that he had joined the movement without as yet knowing much about what it meant to do in the cases of those who declined to join. "I told them, however," he added, "that I would not bind myself to live up to any prices or rules which I didn't think to be for the best interests of my business. We ought to get better prices, and I am told the association will be able to reach those who won't come to terms. The conference in Boston will settle much that is now 'indefinite.'" The proprietor of still another Chestnut street gallery said that the chief object of the association was to elevate the profession and encourage the production of better classes of work. "It is not to be expected," said he, "that a man in a less favorable locality and with poorer appurtenances will get as high prices as I can, but he will be encouraged, so as to bring him up to a higher standard." He could not say how this was to be done, but said the details would all be talked over in the coming conference.

THEY DON'T THINK IT WILL WORK.

On the other hand there are very positive opinions on the other side of the question. A prominent photographer, who runs two large galleries in the business part of the city, says that he declined to join, because he thought he was better able to regulate his prices and his studio than anybody else. The agents told him, he said, that the association would protect its members from loss, but he had not that much confidence in the financial strength of the organization. "Suppose I raise my price \$2 a dozen," he asked, "and as a result lose \$10,000 in my business, will I be likely to be repaid? I think not." He went on to say that after he had refused to go in, one of the general officers came in to see him,

and told him that he would before long be on his knees begging to be admitted, as the association would, if necessary, cut the price to "ten cents." The *Ledger's* informant added that threatening talk of that sort convinced him all the more strongly that he didn't want to have anything to do with the association.

Another photographer, who has not joined, said he thought "it couldn't be done;" there were too many men in the business and the avenues too wide for those who wanted to begin for a combination of this sort to be successful. "If they get the manufacturers into the 'combine' with them and attempt to freeze out non-members, they will find that there are ways of getting supplies which associations cannot control."

The stock dealers are reticent upon the subject, they not being included in the scope of the organization.

"We have not been approached in any way," said one of them, "but we feel that the association, if anything, is likely to be antagonistic to us. We don't think, though, that it will amount to anything."

Another business man, who deals largely with the portrait photographers, said any scheme which looked to the forcing out of the business men who wouldn't combine, would, in the long run, result in failure.

"There is no business," he said, "which is operated upon such small capital as the photographic business, and if the stock dealers were to decide to sell only for spot cash hereafter seven out of every ten galleries would shut up. There isn't money enough in such an association to carry on such a fight properly."

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

EXHIBITION.—The Exhibition will be inaugurated at 5A Pall Mall East, London, S. W., by a *conversazione*, open to members and their friends, at 8 P. M., on Saturday evening, the 28th of September.

The Exhibition will remain open daily (Sundays excepted), from Monday, September 30th, until Wednesday, November 13th. Admission (from 10 A. M. till 5 P. M.), one shilling. It will also be open every Monday, Wednesday and Saturday evening; admission (from 7 to 10 P. M.), sixpence.

Members have free admission at any time, and will be supplied with tickets to admit their friends.

Medals will be placed at the disposal of the judges for artistic, scientific and technical excellence of photographs, and for lantern transparencies and apparatus.

In accordance with Rule No. 37 of the Society, the undermentioned gentlemen have been proposed, and elected by the members to act as judges: W. Bedford, V. Blanchard, G. Davison, W. England, J. Gale, H. P. Robinson, J. Traill-Taylor.

Photographic Pictures.—Each exhibitor will fill up a printed entry form (supplied by the Society). This must be inclosed, with letter of advice, and addressed to the "Hon. Secretary," Photographic Society of Great Britain, 5A Pall Mall East, London, S. W.

At the back of each frame must be written the name and address of the exhibitor, with the title or description of the picture, and the number (if there be more than one) to which it refers in the entry form. Each frame or picture may have the exhibitor's name, and the title of the picture, neatly inscribed, and this

only. Pictures in Oxford frames, and pictures previously exhibited in London, will not be admitted.

With any work sent in produced by a special process of the exhibitor, information as to particulars should be communicated.

Photographic Apparatus.—Each exhibitor will fill up the entry form (supplied by the Society), and write a concise description of each piece of apparatus; on the exhibit itself a removable card must be attached, containing the name of the exhibitor, and the number to which it refers in the entry form. Attention is requested to this regulation, as without it difficulties arise, and the apparatus may not appear in the catalogue. The exhibitor should fasten on each exhibit a small adhesive printed label, containing his name only.

Apparatus and appliances that have been already shown at London exhibitions may be refused, and also those that do not embrace some points of special interest (to be mentioned by the exhibitor on the entry form).

Photographs colored by scientific or mechanical means will be admissible. Photographs colored by hand will not be admitted. Negatives and transparencies will be admitted.

The name or title of all exhibits must be entered on the Society's entry form.

No charge will be made to members of the Society for exhibiting their pictures; but to non-members a charge of one shilling per square foot will be made for wall space; the minimum charge being five shillings. It is requested that postal orders to pay for the wall space required by the non-members be inclosed with the entry form; and should any of the pictures sent not be hung the due proportion of wall space charge will be returned. The charge for wall space to those exhibitors who may become members of the Society at the November and December meetings will be remitted, and the amount paid credited to their entrance fee and subscription.

The apparatus being under personal supervision and explanation of a competent attendant during the whole time the exhibition is open, a fixed charge is made of five shillings to members and ten shillings to non-members, which, in all cases, must be inclosed with the entry form, or such apparatus will not be received.

A list containing the price of pictures and apparatus to be disposed of will be laid on the table. It is desirable that professional exhibitors should state the price of their pictures on the entry form, as frequent inquiries are made of the Assistant Secretary (who is in charge of the exhibition every day) respecting the price of framed and unframed copies. Ten per cent. commission will be deducted on sale.

Foreign Exhibitors are specially invited to contribute. The Society will pay the carriage of photographs one way, also provide frames during the exhibition, for photographs approved by the judges; and there will be no charge for wall space.

Exhibits sent in packing cases (carriage paid) must be addressed to the "Photographic Society of Great Britain," care of Mr. James Bourlet, 17 Nassau Street, Middlesex Hospital, London.

Packing-cases must arrive not later than Wednesday, September 18th; they will be too late if received after that date. No packing-cases can be received at the gallery.

Exhibits (including pictures, negatives, transparencies, lantern slides, apparatus and appliances, etc., sent by hand) will be received at the gallery, 5A Pall Mall East, on Wednesday only, September 18th, until 9 P.M. Special attention is requested to the sending in of apparatus on the day appointed, Wednesday, September 18th, as delay in this matter may prevent exhibits coming under the inspection of the judges.

Lantern transparencies sent in competition for the medal, not less than six, should be fitted (removable) in a frame to stand upon the table, and it is desirable that duplicates be sent for exhibition in the optical lantern. They must be delivered on Wednesday, September 18th, and will only be eligible for award when both the negatives and slides are the work of the exhibitor.

Photographic lantern slides will be shown with the society's optical lantern during the exhibition. Slides are invited to be sent for this purpose; they must not exceed $3\frac{1}{4}$ inches in height, and, to enable the committee to select and arrange them, must be delivered at the gallery not less than one week before the evening of their being shown in the lantern.

Conditions.—It is to be distinctly understood that the sending of exhibits signifies acceptance by the exhibitor of the decision of the Council upon all matters connected with the exhibition, as absolute and final. The Council do not hold themselves responsible for any damage that may happen to the pictures, or other exhibits, whilst in their custody, but they will take every precaution to insure their safety and prompt return to the owners at the close of the exhibition.

To avoid damage to frames, exhibitors are requested to have sunk backboards to their frames, with the fastening nails not projecting, and the whole covered with thick brown paper.

Exhibits received in packing-cases will be repacked and dispatched directly after the close of the exhibition.

Exhibits left at the gallery by hand must be fetched away on the day appointed, due notice of which will be sent to the exhibitors.

Particular attention is requested to the removal of exhibits on the day appointed; if not taken away then, considerable expense is incurred by removing them from the gallery to be warehoused, which will be charged to the exhibitor.

Exhibitors not being able to send to the gallery, can, by giving instructions to the Assistant Secretary, and paying the cost, have their pictures packed in a case and sent to destination by carrier.

Blank entry forms and any further information respecting the exhibition, apparatus, lantern slides, also nomination forms for membership, can be obtained from the Assistant Secretary, Edwin Cocking, 5A Pall Mall East, S.W.

OBITUARY.

GUSTAVUS BODE.

AGAIN grim Death has taken away from our midst one of the most genial and upright men connected with the photographic world.

Mr. Gustavus Bode, the well known chemist and dealer in photographic materials, of Milwaukee, Wis., is no more. He died quite suddenly from a stroke of paralysis on July 25th, aged fifty-five years.

The deceased was born in Cassel, Germany, and received his early education

at the Gymnasium of that city (where the present Emperor William received his first training), and completed his studies at the Universities of Göttingen and Heidelberg, after having previously served a four years apprenticeship in the drug business and passing a successful examination before the Board of Pharmacy of his native city. In 1858 he emigrated to this country and located at Cincinnati. From there he removed to Milwaukee in 1861, serving first as clerk, and afterwards associating with Mr. Tesch, who, at that time, was adding a photographic department to his drug store. The partnership terminated in 1874, Mr. Bode taking as his share the photographic department of the old firm.

From this time dates his popularity. Plain and simple in his habits, of strict and honest business principles, a warm-hearted friend, he was well liked and honored by all who engaged in business with him. Six years ago ill health compelled him to give up his business, and seek recreation and new strength in the milder climate of his native home. After his return, his main occupation were his favorite chemical studies and analytical researches.

To his bereaved family, who have lost their best friend, we tender our heartfelt sympathies.

MULTIPLE MAGNESIUM FLASH LAMPS.

To the Editors of the BULLETIN :

In my recent experiments with the magnesium flash lamp I find that a given amount of magnesium gives a better light when divided and burned in two or more lamps than when burned in a single lamp.

This has led me to adopt a modified form of my lamp (see "International Annual" for 1889), and I now use the double lamp almost exclusively. The quadruple form for larger groups is, however, much better. The inclosed blue prints will sufficiently explain the new form of lamps.

I send you also a photograph of a family group taken at night with the double lamp and burning but $7\frac{1}{2}$ grains of magnesium, which gave ample "time."

In developing a slow developer should be used, as the high lights will otherwise be too dense before the details in the shadows have time to appear.

In an ordinary parlor I find that from 5 to 7 grains of magnesium in the "double lamp" is all that is required.

Yours truly,

MANLY MILES.

The blue prints sent show the double and quadruple lamps. These are arranged with T connections and rubber tubing, so that all are fired simultaneously by pressing a single rubber bulb. The family group is excellent; we would not have known it was a flash-light picture.—Eds.

OUR ILLUSTRATION.

THE charming little study forming the frontispiece of this issue of the BULLETIN is from the studio of Mr. E. Decker, ex-President of the Photographers' Association of America. As a study in child portraiture it contains many points worthy of attention; the graceful posing, the very effective lighting, and the generally soft and artistic spirit in the picture, are certainly to be admired. The negatives were made upon Cramer dry-plates, and are of uncommonly fine quality. The prints speak for themselves.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

REGULAR MEETING, TUESDAY, JUNE 11, 1889.

(Continued.)

Then I should call your attention to another point, and that is, that in the front portion of the camera, at the top, are inserted two levels—one for the up and down adjustment, and the other for the side adjustment of the camera. The intention is that the camera shall be placed exactly level, no matter if the object which you are going to photograph is on a high hill. Another peculiar feature is the compound rising front. Ordinarily a rising front is made of one board, which is raised and put in place, and fastened with a thumb screw. In this case it is divided into three sections, so that one slides upon the other, and this allows the lens to be pushed down almost to the bottom or nearly to the top of the camera. Another feature of this adjustment is that the lens is held in both the first and second sections of the rising front, and it is because the rising front has to be so thick that it is divided into these different sections. Now

I will proceed to level the camera, and then show you the adjustment of the lens, which is another novel feature. We will suppose that we are leveling the camera. (At this point some one objected that the camera stood so high one could not see the levels.) Mr. Beach replied: I have always adopted the method, in taking a view, of having the camera legs spread out well; then you have a better base, which, as you will observe, lowers the camera enough. The point about the adjustment is, that the lens is inserted in a ball and socket joint, and now is pointing up as if one were taking a view of a house on a hill. If it is desired to change the adjustment, all you have to do is to rotate the flange ring in front here on the rising front, and in thus loosening the ball and socket joint, the lens can be tilted horizontally, and then, by screwing up the flange, it is locked and held in position. The object of that is to do away with all the swing-backs in the camera, and you adjust the view by raising the front and tilting the lens either up or down. You see it works very easily.

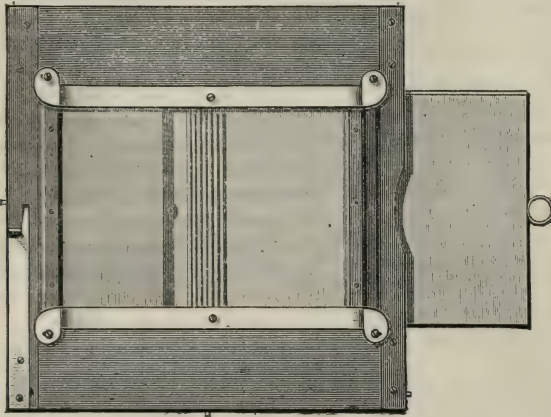
In regard to the back attachment, there is simply a frame, something like the Blair camera, and it has opposite the ground glass the arrangement similar to that which is used in an ordinary plate holder. The ground glass is forced forward by two springs, and on the extreme end, opposite to where the plate holder is inserted, is an ordinary flat spring, which has a little pin attached to it, which passes through here and operates on the plate holder. The plate holder itself is quite a novelty, and quite a radical change; it is a metallic plate holder. It is scarcely any thicker than the ordinary plate, and is composed simply of a sack of tin which is nicely varnished, and the plate itself is carried on another sheet of tin stamped out the thickness of a plate. There is the plate holder and the plate (exhibiting them). See page 474. At one end of this septum is a spring. You simply push the plate in against that spring, and then let it slide back until the two little wire fingers on opposite end of the holder overlap the plate and hold it. This septum, with the plate in, is then slid into the outer sheath. The operation of exposing a plate is quite simple. After you have inserted the plate in the septum, you simply push it home, and the push on the outer end of the septum makes a light-tight joint. There is also a little hole in the end of the septum here, into which the spring which I showed you on the back of camera catches. After pushing the plate holder into the back

of the camera, when you draw the slide to make an exposure, you simply draw off the outer sheath, leave your plate exposed, and when you get through you put the sheath over again, and it is all done.

Now I will show you how easy it is to put the plate in. There is a special light valve in the end of the ground glass frame. This little spring on the outside end locks the septum,

We will leave the camera here, and any members who may desire to examine it will have that privilege.

The *President*—Mr. Wing, as some of the older photographers present will know, or any of us who will take the pains to read up will find, is a very ingenious man, and away back in the sixties Wing's multiplying camera was a very well known article and the subject of a



after the plate holder is pushed in. Now you cap the lens, and all you have to do is to draw off the sheath, and you can tell by the bright tin of the septum, seen through the ground glass, that you have drawn the slide sure. (Laughter.) After you have made the exposure, you simply push it back, lift the flat spring with your finger and pull out your plate holder, and it is all exposed. When I

very bitter lawsuit, which was in the photographic world a very remarkable thing, and was reported all over the country.

On Friday, June 14th, Professor Elmendorf will give a lantern slide exhibition of Centennial Parade and other views, and will explain the process of making them.

Dr. C. Stuart Welles has completed his set of views of "The Tour of the Nile," and will



first saw it I thought it was quite an idea and quite a radical change from what we have been accustomed to. The only point against it that I made, was that the weight of the metal was too heavy; but I believe the makers claim that the weight of the tin or the metal is not more than the weight of an ordinary wooden plate holder, but I should rather try some experimental tests in weighing before I accepted it as being true.

give an exhibition before the Society. As June 21st will be convenient, we will announce that evening as the time of the exhibition.

The dark room is nearly finished. It is probable that it will be entirely closed for work for two or three days this week, while the workmen are putting in electric lights.

Mr. Beach has presented a copy of "Naturalistic Photography" to the Society.

Mr. Alfred Stieglitz, of Berlin, has presented

to the Society six prints on aristo paper, a part of his exhibit at Philadelphia. These are presented to the Society through the kindness of Mr. Schram, of our Society.

The Kodak flash-light picture on the wall, which you all have seen, has been sent here by Mr. Millburn, of the Eastman Company.

Mr. McKune has, after considerable trouble, obtained a permit for each individual member of the Society to take photographs in Central Park. These permits will be handed to the members after the meeting, or sent by mail. I presume a vote of thanks will be in order to both Messrs. Millburn and McKune for their kindness.

A vote of thanks is also in order to Rev. Dr. Collyer for his address at Chickering Hall.

I have here a letter from the Chairman of the Chickering Hall Committee, giving a report of what was done at the meeting. The amount of the check which was turned over to the fund was \$372.74.

Since the last meeting the following gentlemen have been elected members of the Society: Ernest Warrin, New York, Active; William T. Wintringham, Brooklyn, Corresponding; J. M. Winants, Bergen Point, N. J., Corresponding; Horace H. Chittenden, New York, Active; William F. Bruns, New York, Active; G. D. Millburn, Rochester, Corresponding; E. B. Kiersted, Jersey City, Corresponding; Paul Sala, Newark, N. J., Corresponding.

Mr. DUFFIELD—I received Monday a couple of papers and a circular mailed from Rochester on Saturday, announcing that the Eastman Company have perfected their transparent film. It is a celluloid film. I know they have been, for the last two or three months, trying to perfect this film. I am told they will immediately build a factory which will employ four hundred hands, and intend placing the film on the market in large quantities. The composition is a mixture of celluloid and something else, but it is perfectly flexible. It does away entirely with the striping of the films.

I will pass among the audience some bottles of E. & H. T. Anthony & Co.'s ingredients for developer, put up in tablet form. This manner of putting up the chemicals is a very great convenience for the touring photographer.

The *President*—We will now listen to Mr. A. Peebles Smith on the "Making of Lantern Slides."

Mr. Smith then exhibited a few pictures on the screen, illustrating different developers.

THE MAKING OF LANTERN SLIDES.

Mr. SMITH—During the past winter I had occasion to make a number of slides for Professor Cromwell when he exhibited at the Grand Opera House. While doing that, an old theory, to my mind, was exploded. That is, that the nearer the lantern is to the screen, the denser the slide should be. His pictures, as you may well know, are enlarged up to about 75 feet square. The lantern is placed fully 100 feet from the screen, and the slides which I first made went to pieces; they were too thin. I couldn't account for it; but went to work and made denser slides, with no better results. I soon found out that it was not density which was required, but the color. The slide should be absolutely clear in the shadows and lights. Since then I have experimented with a great many developers, the effects of five having been shown here by the lantern, and I have decided in favor of antipyrine. I use it the same as I would hydroquinone—that is, take antipyrine, dissolve it in sulphite of soda solution, then make an alkali, the best alkali being caustic potash—the most active. Develop your plate. I have a brass plate about 5 inches in diameter. This is attached to a wheel, under which is a lamp. The lamp heats the brass plate, which in turn warms the gelatine plate, and a centrifugal motion given to the plate causes the softened gelatine to run together until the relief of development entirely disappears, leaving the gelatine free from veiling, which is often the case with gelatine slides. After that I used to varnish with collodion, which I have long since discontinued. I take an ordinary varnish, add to it one or two chemicals, which are not commercial and in stock houses, but which can be obtained in drug stores the same as antipyrine; make a water varnish and varnish the plate while wet, and then place away to dry, which gives a beautiful, clear slide, as you can see by these which I pass around. They are free from grain and with apparently no density at all. But the lack of density is made up in the clearness of the lights and the clearness of the shadows. The reducing agent, antipyrine, is very slow, requiring at least thirty minutes to produce a slide. This, commercially, would be out of the way, as a man would starve to death making slides as a matter of necessity; but for the amateur who wants beautiful work on dry plates, he can do it.

My next attempt after using this antipyrine was to try acetanilid. This is a very insoluble chemical. I find it reduces much quicker

on a slide plate than the antipyrine, but the deposit of silver is much coarser. That you can see from the slide exhibited. The formula that I have used with acetanilid is practically the same as the other.

Of late I have been experimenting somewhat with collodion emulsions. Mr. Newcombe, of the Scoville Company, has been at work all winter in that direction. He has now an emulsion which more closely resembles the wet plate than any I have seen yet, in which a bath is used.

With the collodion emulsion the great trouble seems to be that the film is too thick, and with it you get too strong a contrast. You take a very thin negative, one slightly under time, and with collodion emulsion you get a negative beautifully clear in the lights and beautifully clear in the shadows, providing you don't develop the plate too quickly; and the great trouble with the wet plate process is, that you are apt to have the developer too powerful, especially when pyro and alkalis are used. Iron is a little slower in its action, and you are not apt to get this strength in the slide. The objection to iron seems to be that it does not penetrate the collodion, and experiments made lately in that direction seem to be entirely in favor of pyro as a developer. I have a slide here which illustrates this emulsion of which I speak. As to hydroquinone being used as a developer for lantern slides, the formula which I use is one containing a great deal of sulphite, the alkalis used being phosphate of soda and caustics. After the slide has been developed, I make a solution of carbonate of barium in water, which is poured over the slide, which acts as a cleaner.

With hydroquinone as a developer for slides, the color which you get has a tendency more to warm tones, unless the negative be very dense, and for that reason I do not like it; I find that in slides, if you get a brownish black or a color with a trace of pink in it, it is much prettier and will show to much better advantage on a large screen with the lantern a good distance from it than one containing the slightly reddish tone which hydroquinone gives. For that reason I use old developer with splendid results on dry plates, getting tones ranging from a warm tone to a blue-black. The blue-black can be obtained by making a solution of iron, say 60 degrees by the hydrometer, and adding to it from two to three drachms of sulphuric acid. Make a solution of oxalate of potash, and add to that oxalic acid, both being put together in the usual way for oxalate developer, and then

adding a little more sulphuric to the developer you will get a tone ranging on the green-blue, which you see in the exhibited slide, which gives it apparently no density, but on the screen it shows a pretty effect.

If you have a tray of 5 x 8 inches, and you develop in it two slides, you can have the proportion of 2 ounces of oxalate to 2 drachms of iron solution. The sulphuric acid gives the cold greenish effect upon the Carbutt plate. I have used it on the Eastman plate; but you are not as sure of the tone on that plate, as that is a bromide of silver plate. For that reason the Carbutt plate gives the blue-black tone much easier. The method of developing these slides—quick development—seems to give the best results without graining. The usual method of producing slides has been by daylight; but I discarded that about six months ago, owing partially to my being so placed that I could use daylight, and partially because I wished to experiment in another direction. I have since been using magnesium light altogether. There is a certain quality to the light used in making slides by magnesium that you don't get by daylight. For instance, you are exposing a plate to daylight. Your lens is slightly stopped down, and you make the exposure. The negative may not be even. You try to cut off the light here and there, and your light penetrates the shadows of the negative quicker than it does the lights, and the light detail is only obtained at the expense of the shadows. When you develop that plate your shadows come first. Your lights lack the detail which we like to see in them, and the result is a sort of halation which runs through the plate and produces a sort of foginess. Your slide is not clear and does not show clear glass like the wet plate. The use of the magnesium ribbon prevents this, and you can set the light from any point. You can favor the sky or the shadows. One of the principal causes of halation is the light coming in around the edge of the plate and working its way into the plate as you develop. This can be prevented by making a mat, which you place in front of the slide before it is finished. This keeps all rays away from the plate, with the exception of those which pass through the negative. The result is that the glass around the plate is perfectly clear and the light cannot work in where you do not want it.

Now as to the apparatus I employ in producing slides. It is so simple I think I will describe it. In the first place, I use an ordinary camera, as ordinary as anybody pos-

esses. I have the kits ranged in a frame in a box 5 x 8, and in case some good-natured friend loans me an 11 x 14 negative, I can reduce that. If I am not using daylight I take a printing frame, which is the only handy thing I have in the house, 11 x 14. Over that I place two or three sheets of cepa skin. Behind that is a little box with the negatives in it. Just beyond that is the camera with the lens. Now, in using the magnesium ribbon, I use only two or three inches of it. When everything is in readiness to expose, I have two or three little sheets of cepa skin. With the negative in its place, I hold the ribbon so as to simply allow the magnesium light only to cover those portions of the slide I desire. When the slide is developed you get that tone so much desired on dry plates, and you do not get that fogging in the lights you would get with daylight, because the exposure is rapid—that is, in comparison to daylight. It is this way. You expose by daylight. If you can do it and take your time, you will get a very good slide, free from this fogging; but if you expose longer, for the reasons named, then the result is contrary.

For focusing I place a lamp just back of the diffusing screen, and that illuminates the negative sufficient for focusing. Any lamp will do. The mat on the slides prevents that halation which I spoke of, and enables you to work without covering your camera or the box which holds the negative. There is light passing between the camera and the negative, but this mat so cuts off outside rays that you only get the light that passes through the camera. In all copying and reducing cameras there is always a place in which you put your hand and remove the cap. There are always rays of light which are not used. If you will protect by a mat you don't get these on the plate, and you don't get the action of them when you come to develop.

Mr. BEACH—I would like to know if you have tried this method of shading the negative by daylight, and if you do not find it work as satisfactorily as at night?

Mr. SMITH—Yes, I have done so, putting clouds in on the same plate from two different negatives, something the difficulty of which you can realize. That has been done by shading the negatives here and there, and then developing both exposures at the same time.

Mr. BEACH—You use a very large lens?

Mr. SMITH—I use a small 5x8 lens altogether in producing slides, and the plates are quickly developed. They do not have time

to veil. Then the time is a very essential thing. The beauty of working by this method is for those who do not have much time. If you make slides with magnesium from a certain negative, and get the time, you can mark upon the slide just how much magnesium you use. Then the next time with a certain emulsion you may be using you can duplicate that and have the time exactly right.

Mr. BEACH—Do I understand that the screen is placed in front of the negative before your light?

Mr. SMITH—First is the magnesium, then the screen, and then the negative, camera and plate.

Mr. BEACH—Is the lens in behind the screen?

Mr. SMITH—The magnesium is in front of the screen and diffusing the light. A number of people who have seen the apparatus which I employ seem astonished. They give me large negatives and wonder how I reduce them. But I do it by taking a printing frame of the size of the negative, placing the negative in the printing frame and back of that the diffusing screen, the magnesium close to the diffusing screen, about six inches away from it, keeping the magnesium in motion while I am exposing the plate.

The President—How far is the screen from the negative?

Mr. SMITH—The screen is only about an inch and a half from the negative. Then comes a little box arrangement which shades the negative from any rays that may come in over the top, and then comes the camera.

Now as to dry plates compared with wet plates, there are points in favor of both. The wet plate gives you the clearest slide and the most freedom from grain. Clear lights and clear shadows can be obtained upon the dry plate with a good deal of care and skill and time expended. The wet plate possesses the advantage of being quicker, not in the sense of working, but the slides may be finished more quickly. The wet plate has this advantage, that with it the tones can be varied the same as on dry plates, but you don't preserve a certain tone value that you do in dry plate slides. Myself, I prefer the wet plate. There are difficulties in the way of working it which everybody cannot overcome, and I think if the dry plate were worked up more it could be made to come up to the wet plate standard as regards freedom from grain, which is essential.

Mr. BEACH—Have you seen any slides made by Professor Elmendorf?

Mr. SMITH—I have not seen the slides, but I have seen some very beautiful things from Paris in the way of dry plate slides, which assures me that they are at the head at present.

Mr. STEBBINS—I would like to ask Mr. Smith first how he dissolves his acetinalid. I have handled that a good deal, and my memory is it does not go with water very well.

Mr. SMITH—I speak of this merely as a result of experiment. In dissolving it I use sulphuric acid and also alcohol, but you have to use them right in connection with it. It precipitates itself; and by using a strong alkali I manage to produce the image, and afterwards, by a toning process, which I hope to explain later on in relation to dry plate slides, I get the density required to make the thing a success.

Mr. STEBBINS—If I remember rightly, you stated that barium carbonate was a very good thing for clearing negatives from stains, etc. I cannot, for the life of me, understand why that should have any action whatever on the plate. Certainly, it is a white powder, and I should think instead of removing stains it would have a tendency to produce white specks in the film. If Mr. Smith will explain how he overcomes this I will be obliged to him.

Mr. SMITH—Barium carbonate has been used in the wet process as a cleaner of collodion. That is, from the very fact of its being a precipitate, and precipitating onto the film, it prevents anything that you are using in developing from working into the film itself. It has no cleaning action whatever on the plate.

Mr. BEACH—Do you rub the precipitate off?

Mr. SMITH—It is washed off. Instead of using alum, which has an action, I use that to cover the plate, and do the chemical work while it is covered.

Mr. DUFFIELD—Have you ever tried fast lantern slide plates?

Mr. SMITH—I never have, but I have made lantern slides upon exceedingly rapid dry plates.

Mr. BEACH—I beg to differ a little from Mr. Smith's remarks as to shading the negative in reducing by daylight. I had a little experience last fall in making a number of slides. In two or three cases I had some negatives which were very clear in the shadows and very dense in the high lights, and the only manner in which I succeeded in reducing the slide equally was to take a piece of paper and hold it up in front of the shadow, allowing an exposure, say, of ten seconds originally for the whole negative, and then shading the

shadows by moving in front of them this little piece of paper, and giving the high lights an exposure of perhaps a minute, so as to be sure to have an effect upon the dry plate; and the consequence was, when I developed the plate the details all appeared in the high lights just as nicely as they did in the shadow, and I got a very soft and beautiful slide; and I contend that can be done just as well by daylight as at night.

The President—Have you tried magnesium, Mr. Beach?

Mr. BEACH—I never tried it extensively.

Mr. SMITH—One point further. In the use of magnesium on positives I don't shade with paper. I shade with color screens, different colors acting differently on certain portions of the plate. That was a point I didn't mean to tell you, but you drew it out.

Mr. STEBBINS—I desire to ask Mr. Smith what means he employs for carrying off the magnesium fumes. It seems to me magnesium light is very nice, but there is one great drawback about it, and that is the smoke, and I would like to ask Mr. Smith how he disposes of it?

Mr. SMITH—I do this work mostly in the evening. I do not make more than eight or nine slides of an evening, and generally by the time it gets too smoky I make my escape.

The President—I think that is very good—eight slides and one escape. (Laughter.)

Mr. BEACH—I maintain that with daylight you can obtain just as nice and soft a tone on your slides as you can get by magnesium.

Mr. DUFFIELD—I do not think generally it is right that we should move a vote of thanks to our members for what they do for the Society, as what they do is simply their duty towards it; but Mr. Smith has been so entertaining in his remarks that I think we might as well not put that rule in force just yet, and give him a vote of thanks. (Motion seconded and carried.)

Mr. BEACH—I would like to state that so far as I am informed the Society has not made any official acknowledgment of the courtesy the Secretary of the Navy and Admiral Porter gave to the Society, and the privileges which they granted the Society on the Centennial Naval Parade, and I move that a vote of thanks be extended to them, and that our Secretary be instructed to write to them to that effect. (Motion seconded and carried.)

Mr. BEACH—I believe there is a report of the Committee in charge of the Chickering Hall Exhibition?

The President—There is a report here, but

it is more properly made first to the Board of Directors. It will duly appear in the printed proceedings.

Mr. DUFFIELD—I expect to have at the rooms, from the Eastman Company, some of their celluloid films for examination. They will be here at any time if any of the members wish to see them.

The meeting then adjourned.

Bibliography.

A DICTIONARY OF PHOTOGRAPHY. By E. J. Wall. New York: Anthony's Photo Series. No. 25.

This is an excellent little handbook of photographic terms and explanations, arranged in alphabetical order. The articles are clear and concise, a large number of diagrams illustrate the text, and the volume is presented in such a manner that we can conceive of very few photographers who do not need such a book. It is a small octavo volume of about two hundred and forty pages, well printed, neatly bound and good paper; in fact, it is in every respect a thoroughly serviceable addition to the library of the working photographer.

TRAITÉ ENCYCLOPÉDIQUE DE PHOTOGRAPHIE par Charles Fabre. Paris: Gauthier-Villars & Fils, 55 Quai des Augustins.

We have before us the first part of this publication. It is to be a veritable encyclopedia of photography, and will show not only the modern appliances and processes, but will also exhibit the manner in which these have risen to their present state of perfection. The completed work will be in four fine volumes, and the twenty parts will be issued monthly, containing about eighty pages. It is a large octavo size, finely printed and well illustrated. When completed it will be the most comprehensive work on photography ever issued in any language.

THE BOOK OF THE LANTERN. By T. C. Hepworth. New York: Edward L. Wilson, 853 Broadway.

This is an excellent little manual by one of the best English experts with the instrument. It gives directions for managing the lantern, and detailed descriptions of its applications to educational and exhibition purposes. It also shows the application of the lantern to photographic enlarging, and gives some excellent directions for the making and coloring of

lantern slides. To those using the lantern this handy little volume appears to us indispensable.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—W. S. E. sent us an express package and writes: I send by to-day's express the lemon of tartar in reply to the article which was published in the last number, and in the "What Our Friends Would Like to Know" column of the BULLETIN. I think a good many of our friends will be interested in this, as it is very useful.

A.—The solution in the bottle is a very weak solution of citrate of sodium. The name lemon of tartar is misleading, and we had never heard of it until the question was put to us by you.

Q.—T. R. S. writes: Will you please inform me through the columns of the BULLETIN where I can obtain a copy of "Photography For All," by W. Jerome Harrison, and the price of it?

A.—It can be obtained of our publishers, who will furnish you the price.

Q.—W. N. G. writes: Will you kindly enlighten me, through the columns of your next issue, as to cause of following described failures: My hydroquinone developer was made from formula published on page 247 of your last "Annual," and on previous "time" and "instantaneous" exposures worked well. But on lot of five plates—one "instantaneous" and four "time"—the last time used, worked "hazy" on first plate developed, of "time" exposure; the next, "instantaneous," produced a sharp, beautiful negative; and the balance, three "time" plates, came up slowly, black and with no image, and, after "fixed," barely visible. I used ice and the plates developed slowly. They could not be light struck, as other plates filled and handled at same time, but, developed a few evenings previous, worked well. If the alkali was decomposed, how could the "instantaneous" come up so well? And if such is your theory, what can I use to preserve the developer? Or can you give me a safe hot weather hydroquinone developer formula?

A.—We cannot fully appreciate your difficulties unless we see the negatives; but as a general rule we find that too much alkali at the beginning of operations and lack of time in development are the chief causes of failure with hydroquinone. Use half the alkali and work slowly. As a rule the developer keeps well, and if your chemicals were pure and your bottles clean when the developer was mixed, you should have no difficulty. The addition of metabisulphite of potash to the hydroquinone developer greatly helps its keeping qualities. Twenty grains in 10 ounces of the formula you use, with hydroquinone, will answer.

Q.—P. F. K. sends a package of powder, and writes: Will you please test this powder? I am using it in my toning bath, and it works very well.

A.—It is a mixture of dry washing soda and common salt. This mixture is commonly used in toning baths; but the bicarbonate of soda is better than the carbonate when used with salt.

Q.—H. C. N. writes: Mr. Carey Lea said in closing his paper on the photo-salts of silver, that he had discovered another class of salts, which differed greatly from the photo-salts, being completely destroyed by solution of ferric chloride. Can you give me any information regarding them or tell me where I can obtain any?

A.—We do not remember the particular salts referred to by Mr. Lea; but they are probably closely connected with his recent researches on metallic silver. Some of the recent numbers of the *American Journal of*

Arts and Science contain papers on these researches, and we hope to reproduce them in the BULLETIN.

Views Caught with the Drop Shutter.

COLONEL V. M. WILCOX, the President of the firm of our publishers, has just returned from his vacation, and appears to be greatly improved by it. The gallant Colonel always looks well and in good health; but his recent rest has certainly made him look more hearty.

HENRY G. PEABODY, of Boston, has just finished the illustrating of a volume of fifty pictures of points of interest along the coast of Maine, from Campobello to the Isle of Shoals. A descriptive text accompanies the pictures, which are printed by the Photogravure Company, of New York, and the points of interest are written upon by a number of well known authors. The volume is handsomely presented from the Riverside Press, on heavy paper, bound in morocco.

Mr. RICHARD A. ANTHONY, the Vice-President of our firm of publishers, has started on his vacation for a much needed and well earned rest from business. It is his present purpose to spend the first part of his time at Alexandria Bay, Thousand Isles, and the remainder, from August 15th to September 1st, at Newport, R. I. We hope that he may return greatly benefited by the change.

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CHILIAN BEAUTIES.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

AUGUST 24, 1889

Vol. XX.—No. 16.

THE SEMI-CENTENNIAL AND AFTER.

THE celebration of the first half century of photographic progress is now a thing of the past in America, and we may pause to take note of the results. The officers of the Photographers' Association of America did all in their power to make the Convention in Boston worthy of the time it was intended to commemorate, and their efforts have borne good fruit, although not as bountiful in supply as we could have wished.

When we remember the occasion that the meeting was intended to celebrate, the semi-centennial of photography, we must confess that the attendance at Boston was not what it should have been. Nevertheless, we are rejoiced over the fact that a meeting down East was certainly far better attended than our Western friends would have led us to believe. Five hundred and forty members in attendance is certainly far above any estimates given us in Chicago and St. Louis; and we are very glad to see such a goodly attendance of New England members of the fraternity. We are also glad to hear that the attendance on the days when the exhibition was open to the public was very flattering, and shows a more and more popular interest in the art.

By far the best part of the Boston celebration was the exhibit of the merchants and manufacturers of photographic supplies. It is hard to realize the magnitude of these industries even on an occasion of this kind, and the various large factories vied with one another in the display of handsome, interesting and ingenious apparatus used in photographic work. The immense hall of the Mechanics' Institute was literally packed with every contrivance, useful or ornamental, that would interest the photographer. From the old apparatus of daguerreotype days to the latest results of orthochromatic photography, each and every manufacturer did his best to make the exhibition a representative one, and they deserve the highest praise for their exertions; it was an exhibition of skill and ingenuity that we shall not soon see duplicated.

The art exhibition was very fine, and the pictures were decidedly superior to those of former years, although not so large in numbers. The contest for the grand award given for the illustration of Evangeline was a very spirited one, and

the results obtained were uncommonly fine. The trophy was well worth the contest, and those who failed to secure it may rest assured that the effort made for its capture will repay them many times over in the knowledge obtained while striving to excel. Although the exhibition was not over the average in size, yet the character of the work done and the evident development of artistic taste among photographers, was very pleasant to observe when compared with recent exhibitions.

In regard to the meetings, much good work was done, but very few papers were read. We understand that quite a number of papers were left unread owing to lack of time, and that these will appear in the journals. We cannot see that much more could be accomplished in the time at the disposal of the officers.

During the meeting some good things were accomplished. One of these was the starting of a subscription to raise a monument to Daguerre in America. To carry out this idea, the present officers of the Association are to have charge of the funds, and be ready with plans before the expiration of their terms of office, in January next. By this means everything will be completed before the next meeting of the Association, in Washington, next year. And as the monument is to be placed in the Smithsonian Institution in that city, we think the unveiling will be a very interesting feature of the Convention. This monument is to be raised by subscriptions of one dollar from all interested in the progress of our art. By this means both professional and amateur photographers and others will have an opportunity to honor the man to whom photography and the allied graphic arts owe so much. The BULLETIN will be glad to acknowledge the receipt of any subscriptions sent to its care, and will see that they are safely placed in the hands of the Treasurer of the Association. Let us all lend a hand in this noble work, and one dollar from each will soon give a fund worthy of American photographers.

Another interesting feature of the Boston meetings was the opportunity of seeing some of the veteran photographers of daguerreotype days. Among those present were Southworth, of Boston; Bogardus, of New York; Faris, of New York; Long, of Quincy, Ill., and G. H. Loomis, of Boston. They were called on to address the Association, and the remarks of each were listened to with great attention. It is really remarkable to think that these men are still with us, who first heard the wonder of 1839—that “sun pictures” could be made.

We cannot close this too brief review without acknowledging the kindness and courtesy of the New England photographers to the visiting brethren. On every hand were found evidences of their kind thoughts and attention to the wants of those from other parts. The committee that gave the very handsome entertainment upon the steamer “City of New York” deserve the most sincere thanks of all present. The delightful manner in which it was given, the earnest and painstaking attention of the various members of the Committee, will always be remembered by those who were entertained on August 10, 1889. Such generous and kindly services have never been excelled and seldom equaled in other cities.

We must also not forget the special receptions given by Mrs. Benjamin French every evening during the session of the Convention. In the duties of hostess she was assisted by Mrs. George Hastings, the wife of the First Vice-

President. The pleasant greetings of both ladies will long be remembered by all who had the good fortune to meet them.

Altogether Boston won many laurels for the handsome manner in which it took hold of and carried through the semi-centennial of photography, and to those who were instrumental in securing the success of the Convention we tender our sincere thanks for the satisfaction of being present.

EDITORIAL NOTES.

THE next meeting of the American Association for the Advancement of Science will be held at Toronto, Canada, August 27th to September 7th next. The Physical and Chemical sections are always interesting to photographers, and those of our readers who have the opportunity should attend.

THE pictures of F. Müller, of Munich, Germany, that received the gold medal at the Boston Convention, were sent through the solicitation of Dr. Arthur H. Elliott, of the BULLETIN. They were portraits in platinotype, and certainly the finest prints of the kind ever exhibited at these exhibitions.

DR. ELLIOTT also had charge of a number of lichtdruck prints from Obernetter, of Munich, illustrating the application of orthochromatic plates to landscape, and also to copying of oil paintings. These pictures attracted considerable attention because of the marvelous difference in the results when compared with the prints made from ordinary dry plates, which were also exhibited at the same time.

THE Newark Camera Club recently had an outing in a canal boat, which, if not entirely successful, proved very interesting, and served to show the feasibility of the trip. The boat was fitted up for photographic work, and would have been a grand success if the weather had been propitious. The trip was from Paterson, on the Morris and Essex Canal, and those who participated in it hope to repeat the voyage in good weather, when they feel assured of thoroughly enjoying the outing. We advocated such an expedition several years ago, and feel glad that somebody has had the courage to start one.

THE amateur photographers of Charleston, S. C., have organized to make a series of photographs illustrating the city. Pictures of the ruins left by the earthquake in 1886, which are fast being obliterated, have been secured, and will be of historic value. We hope to hear that the work is well done, and made in such a manner as to be of value to those desiring information about the city and its people.

A PARTY of observers from Harvard Observatory, and under the direction of Professor E. C. Pickering, are going to Africa to watch the total eclipse of the sun that takes place December 21st next. We hope for some excellent photographic work from this party.

WE copy the following from the *Chicago Times*: The first automatic camera will be placed before the public in a day or so. You put a quarter in the slot, pull the cord, and in two minutes out drops your photograph. The machine

is simple. The lens is placed so it comes right in front of the face of a person of average height. A chamber containing a few hundred plates is back of the lens. The cord is so arranged that it opens the shutter and instantly flash powder throws the light on the face. The lens prints a likeness on the first plate back of it. This is rolled over two small wheels which conduct the picture through the developing process. The plates are of celluloid. The inventor of this automatic picture gallery is M. J. Steffens, a 22d street photographer. The model is being made by the Franklin Electric Company, Randolph street.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Eikonogen, the New Developer—Alum Mixed with Hypo as a Clearing Medium—Tannin instead of Alum to Avoid Frilling—Dr. Eder's Experience with Pyrocatechin and Paraphenyldiamin as Developers.

THE new dry plate developer, eikonogen, raises a good deal of dust. The reports about its excellence do not seem to fully agree yet. Many have obtained good results; others, again, very unsatisfactory ones. Still, I have not the least doubt that for short exposures the developer surpasses all others. On one plate which I treated in vain for a long while with hydroquinone developer, after washing the same again, I obtained with eikonogen an excellent picture.

Professor Rietschel reports, also, about very good results with the new eikonogen developer. The developer, according to his experience, works two to three times as quick as hydroquinone, and admits a considerably shorter time of exposure without hindrance to the fineness of details, etc. An instantaneous view (about one-half second) at 7 o'clock in the evening, with a Steinheil group, antiplanet (third last diaphragm), gave a picture full of contrast. Successful portraits were made on a roofed veranda, situated on the north side, at one second exposure. For a satisfactory reproduction of an oil painting, with color sensitive plate, in sunlight and by application of the smallest diaphragm, twelve seconds were sufficient. The preliminary bath recommended in the formula that comes with the developer, as well as the alum bath, do not seem to be necessary, at least they were not employed during experiments with Sachs and Vogel-Obernetter color sensitive plates. With regard to cheapness, according to Rietschel, hydroquinone seems to have the advantage, unless—as was also the case with the hydroquinone—a formula is discovered which will admit a smaller quantity of eikonogen for development than at present required.

In the following formula, discovered by my son, the quantity of eikonogen in the developer can be considerably reduced, so that the price will not be higher than that of pyrogallie acid or hydroquinone.

The pyro developer has the disagreeable property of staining the fingers, and it oxidizes as soon as exposed to the air, and thus loses a considerable part of its effect. The hydroquinone developer, free from these defects, was therefore hailed with pleasure, and quickly made friends, particularly among amateurs. But it works much slower than the pyro developer, which, although of advantage under certain circumstances, will be detrimental and obstructive in cases, as for instance in portraiture, when quick work is required. By addition of caustic potash the development may be accelerated, but unfortunately not all plates can endure this addition.

The eikonogen developer enjoys the advantage of the hydroquinone developer, not to oxidize quickly in the open air, and the development proceeds as quickly as with the pyro developer. The developing solutions mentioned in the prospectus of Dr. Krüger give good results; but they contain a great deal of eikonogen, whereby the price of the developer comes too high. But such a great quantity of eikonogen in the developer is by no means necessary, as proved by my son during his experiments.

Equally good results as with the hydroquinone developer are obtained, if less eikonogen, but more alkali, is applied.

If hydroquinone and eikonogen developer are made after the same formula, and two simultaneously (in the stereoscopic apparatus) exposed plates are treated with the same, it will be found that the plate developed with eikonogen has not such a strong appearance as the one developed with hydroquinone. But the same strength can be obtained as with the hydroquinone developer, if more alkali is added to the developer.

After many tests my son determined upon the following formula, which in its composition is very similar to that of the hydroquinone developer :

SOLUTION I.

Crystallized sulphite soda (or 20 grm. free from water).....	40 grm.
Eikonogen.....	5 "
Distilled water.....	500 c.c.

SOLUTION II.

Potass. carbonate (or an equal quantity of calcined soda).....	50 to 75 grm.*
Distilled water.....	500 c.c.

For use equal volumes of Solutions I and II are mixed.

The mixed developer keeps well in well corked bottles for a good while, but not as long as hydroquinone developer.

As with all developers, it is here also advisable to commence the development with old developer, or, if such is not on hand, a few drops of bromide of potassium (1:10) may be added. (It appears that eikonogen will stand a larger addition of bromide of potassium than the other developers.)

For the development of instantaneous views of very short exposure, the developer as given in the prospectus about eikonogen—

Sulphite of soda.....	10 grm.
Eikonogen.....	5 "
Carbonate of potassium.....	5 "
Water.....	150 c.c.

can be used to advantage; but for other purposes the above formula, which, in consequence of the small quantity of eikonogen, is much cheaper, might be preferred.

The hydroquinone developer will at all events maintain its position for many purposes—for instance, for the development of landscapes, the slow development enabling one to exercise a better control and to develop several plates at the same time. It seems to admit also a larger limit in the time of exposure. But particularly the old hydroquinone developer has great advantages in comparison with the *old* eikonogen developer. The former developed a plate excellently during a test, but slow, while the latter under the same conditions gave a quickly appearing but much thinner and foggy picture.

* Harder working plates, to produce strong negatives, require less, softer ones more, carbonate of potassium.

For all cases, where quick work is required, instantaneous views, development of under-exposed plates, it will very likely be displaced by the eikonogen developer.

Several weeks ago I reported to you about two new developers which in mine as well as in other hands have given less favorable results, namely, pyrocatechin and paraphenyldiamin. They seem to be almost forgotten at the present time. Still, in honor of the truth, I have to inform you that such an excellent investigator as Professor Dr. Eder, in Vienna, obtained lately very good results with these developers. Whether the material was of better quality or a change in the formula, I cannot say. Eder says: I examined lately the pyrocatechin as developer. The pure pyrocatechin came from the chemical factory of Dr. Schuchardt, in Görlitz, and developed with potash the latent picture upon bromide of silver gelatine, quick and strong. The silver was reduced with a coffee-brown color; the liquid assumed a brown color pretty soon. The following formula acted good:

A.

Pyrocatechin.....	1 part.
Sulphite of soda.....	4 parts.
Water.....	40 "

B.

Potash.....	4 parts.
Water.....	40 "

One volume of A is mixed with 2 volumes of B. This developer keeps much clearer than without sulphite of soda; the development proceeds less quickly, but still much quicker than by application of an analogous composed hydroquinone developer. The pyrocatechin developer gives the same or a somewhat higher sensitiveness than hydroquinone developer, and the plates assume much quicker the necessary strength. Even if the quantity of the pyrocatechin is reduced to one-third, the developing strength is still great.

This proves that the pyrocatechin is a magnificent developing substance, which deserves our fullest consideration alongside of the developers at present generally in use (pyro, hydroquinone and oxalate of iron), and whose general application is only obstructed by the high price.

With regard to paraphenyldiamin, Eder says: After several preliminary tests which I made in company with Mr. Von Reisinger, I find that the paraphenyldiamin, $C_6H_4(HN_2)$, which was obtained from the chemical factory of Dr. Schuchardt, in Görlitz, acted well as developer for bromide of silver gelatine plates. It gives about the same sensitiveness (as tested with a Warnerke sensitometer) as pyro or hydroquinone developer. One part of paraphenyldiamin was dissolved in 50 parts of water, and 1 volume of this solution was mixed with $\frac{1}{2}$ volume of a potash solution (1:10). The development took place regularly; the color of the silver precipitate is gray and the picture delicate and soft. Sulphite of soda keeps the solution colorless for a longer while, but retards the development to a very high degree.

Lately many complaints are again heard about frilling of plates in the hypo bath. These complaints are repeated every summer. The best known preventive is alum. Some apply it before, others after fixing; others again mix it with the fixing bath. That it decomposes the fixing bath in the latter case by separating sulphur, is known.

According to Lainer this can be prevented as follows: If to a concentrated alum solution is added a saturated sulphite of soda solution, a precipitate will form, which dissolves again; by further addition a limit will be reached, where a solution of the precipitate will not take place any more; during the reaction a smell of sulphur dioxide can be observed. If such an alum bath is mixed with an equal volume of fixing bath, this will remain clear. Further tests showed that it is not necessary to go exactly to the above mentioned limit with the addition of the sulphite of soda solution to the alum bath. Lainer mixed 1,000 c.c. alum solution (concentrated) with 200 to 300 c.c. sulphite of soda (concentrated), and added to this solution the equal volume, therefore about 1 liter of fixing bath. This mixed alum and fixing bath remained for fourteen days completely clear and undecomposed in open as well as in covered dishes. Lainer reduced the addition of sulphite of soda in the above formula to 100 c.c., and obtained still a clear alum and fixing bath, but of shorter durability. However, there is to be remarked, that according to the quality of the alum the addition of sulphite has to be increased or reduced; in one case 40 c.c. sulphite of soda solution (1:4) were already sufficient for 1,000 c.c. alum solution, to prevent precipitation with the added fixing bath within eight days.

But besides alum there are other means to tan plates and prevent frilling, particularly as alum will oftentimes produce peculiar marbled figures, especially on the color sensitive plates.

For some time myself and son have applied tannin in the following solution:

Crystallized sulphite of soda (or 5 grm. free from water)	10 grm.
Tannin.....	1 "
Water.....	500 c.c.
Strong muriatic acid.....	5 "

Such a solution can be kept in stock for a long while, the sulphurous acid, freed from the sulphite of soda by the muriatic acid, acting as a preservative. The latter has, besides, the advantage that it will destroy any yellow coloration that might have originated during development.

Plates which have a great tendency to frill I flow with this solution, without previous washing; with less frilling plates the developer may be washed off before the solution is put on. The action of the tannin is surprising, the gelatine film being already completely hardened after a few seconds, washing and fixing afterwards as usually.

The tannin solution can also be applied with great advantage to the tanning of prints upon chloride of silver gelatine paper (aristo paper). Here it is best to do the tanning after fixing. Such chloride of silver pictures can be treated exactly like albumen prints, when mounting, without any fear of destroying the gelatine film.

BERLIN, July, 1889.

It ("The Annual") is brimful of valuable reading worth many times its cost.
N. ERSLEY (Texas).

The volume ("The Annual") is very tasty and pretty, and "chock full of meat," and I have not had time to dig it all out yet.

R. D. CLEVELAND (Minneapolis).

It ("The Annual") is fuller of good things than any of its predecessors—a perfect mine of useful knowledge.

JOHN NICOL, Ph.D. (Chicago).

CONVENTION ITEMS.

THE next meeting is to take place in Washington, D. C.

THE officers for 1890 are: *President*, J. M. Appleton, Dayton, Ohio; *First Vice-President*, George H. Hastings, Boston, Mass.; *Second Vice-President*, W. V. Ranger, Syracuse, N. Y.; *Secretary*, D. R. Coover, Iowa City, Iowa; *Treasurer*, G. M. Carlisle, Providence, R. I.

THE attendance at Boston was about five hundred and forty members, and between one thousand and fifteen hundred visitors to the exhibition.

THE *Boston Globe* was the most enterprising paper in the matter of reports of the Convention. Its reporter, Mr. Chandler, is a photographer, and therefore does not make any of the blunders commonly seen in newspapers when giving the proceedings of photographic meetings.

By far the largest and most interesting exhibit in the merchants' department was made by our publishers, and attracted crowds of admirers. Instead of three days, such a collection of photographic apparatus should have been on exhibition as many weeks. The trouble and expense of making such an exhibit is very large and we must congratulate these gentlemen upon the fine results of their labors. We shall notice this in detail elsewhere.

CABLEGRAMS of congratulations were received by the Convention from both the English and French Conventions, which were also in session in London and Paris celebrating the wonderful discovery of Daguerre.

MR. ABRAHAM BOGARDUS, of New York, exhibited a daguerreotype of Daguerre made in Paris in 1846. This relic has now passed into the hands of Mr. G. Cramer, of St. Louis, who offers a copy of it to twenty persons who shall get the greatest number of subscribers to the Daguerre fund.

DR. ARTHUR H. ELLIOTT, the associate editor of the BULLETIN, was unanimously elected a delegate to represent the Photographers' Association of America in the World's Fair of 1892. At Dr. Elliott's request a committee of eight members were selected to choose a practical photographer to act with him.

THE Air-Brush prizes were awarded as follows: For best sketch, finished with air-brush, to W. W. Sherman, of Milwaukee, Wis., for a water color. For best bromide, finished in water colors, to Mrs. Walkup, Rockford, Ill. For best bromide, finished in crayon, to P. Fleming, Chicago.

COLONEL V. M. WILCOX, the President of the house of our publishers, has been selected by the New York Board of Trade and Transportation as a delegate to represent photographic manufacturers in the World's Fair of 1892.

THE Anthony Prizes for work on the Reliable Bromide Paper were awarded as follows:

"We have decided to award the prize for plain enlargements to exhibit marked with a star, and prize for finished work to 'Vindex.'

"Star" Exhibit by

A. A. KNOX, New York.

"Vindex" by

G. H. CROUGHTON, Rochester, N. Y.

F. W. GUERIN,

JOHN BARTLETT,

C. H. DAVIS,

Judges."

President McMichael, in his annual address, proposed to appropriate \$500 for art and scientific lectures before the Association. We think the idea is a good one and should be carried out. Two, or perhaps three lectures at most, upon such subjects, would be very valuable to photographers, especially the younger

members of the fraternity. There would then be something definite for the meetings, and every one would find it both profitable and interesting. Don't let us have cheap lectures—better none than these.

MR. AND MRS. BENJAMIN FRENCH gave the first reception at their residence, No. 10 Newbury street, on Tuesday evening. Some two hundred ladies and gentlemen were in attendance, most of the delegates coming from the extreme Western and Southern States. Among the best known artists and gentlemen identified with photography present were: Mr. Gustave Cramer, Mr. M. A. Seed, Mr. F. W. Guerin, Mr. and Mrs. W. H. Clark, of St. Louis; Mr. J. F. Ryder, and Mr. E. Decker, of Cleveland; Mr. O. P. Scott, of Chicago; Mr. J. M. Appleton, of Dayton, O.; Mr. John Carbutt, of Philadelphia; Mr. McMichael, of Buffalo; Dr. E. L. Wilson, Dr. A. H. Elliott, of New York; Mr. W. Irving Adams, of New York, and others. The photographers of Boston were represented by Mr. George H. Hastings, Vice-President of the National Association, Mr. G. W. Smith, Mr. C. F. Conly, Mr. H. F. Holland and Mr. W. H. Partridge. The large company, composed as it was from every section of the United States, was rendered comfortable and happy by the untiring efforts of Mr. Wilfred A. French, son of the host, who has an extensive acquaintance among artists, manufacturers and dealers identified with the photographic profession. The affair was a success, and the visitors left Boston agreeably impressed with the generous hospitality of one of its well known citizens.

THE 10th annual convention of the Photographers' Association of America was brought to a brilliant close by a trip down the harbor, provided by the photographers of New England. The excursion, which lasted the greater part of the day, took the party in the steamer "New York" along the North shore, which afforded views of Nahant, Marblehead, the half-way rock, Rockport, Manchester-by-the-Sea, and many other points of interest beyond and including Gloucester. Lindall's full military band discoursed music during the trip. Many of the photographers spent their time in taking "snap shots" at noteworthy objects along the route. In every way the excursion was thoroughly enjoyed. Nearly five hundred persons were present, and these were most hospitably entertained by the Reception Committee. In addition to refreshments, dinner was served to the party in the large saloon of the steamer.

Mr. G. Walden Smith, of the Reception Committee, was the toast-master, and he called upon various speakers to address the gathering. President H. McMichael, of the Association, briefly returned thanks on the part of the visiting photographers for the excellent entertainment that had been provided for them. President-elect G. M. Appleton, of Dayton, O., also returned thanks for the cordial hospitality shown. The other speakers were First Vice-President George H. Hastings, Mr. Gustave Cramer, of St. Louis, Mo.; Mr. A. Bogardus, of New York; Mr. W. G. Entreken, of Philadelphia, Pa.; Mr. C. Gentilé, of Chicago, Ill.; Mr. E. Decker, of Cleveland, O.

Among those in the party were: Mr. G. M. Appleton, Dayton, O., President of the Association; Mr. George H. Hastings, First Vice-President; Mr. W. V. Ranger, Rochester, N. Y., Second Vice-President; Mr. D. R. Coover, Iowa City, Ia., Secretary; Mr. G. M. Carlisle, Providence, Treasurer; ex-President H. McMichael, of Buffalo; Dr. A. H. Elliott, of New York; Mr. Gustave Cramer and family, St. Louis; Mr. J. F. Ryder, Cleveland; Mr. Abraham Bogardus, New York; Mr. and Mrs. W. H. Clark, St. Louis; Mr. and Mrs. B. L. H. Dabbs, Pittsburgh; Mr. and Mrs. F. W. Guerin, St. Louis; Mr. George W. Pullman, Washington; Mr. George L. Damon, Mr. and Mrs. Elmer Chickering, Mr. and Mrs. O. C. White, Worcester; Mr. C. F. Conly, W. H. Partridge, Mr. and Mrs. W. A. Webster, Waltham; Mr. S. J. Dixon, Toronto; Mr. C. M. Litchfield, Mr. Charles N. Denault and ladies, Watertown; Mr. W. M. Wires, Lynn; Mr. E. O. Zimmerman and family, and Mr. Freeman and sister, St. Paul; Mr. Philbrick, of Detroit; Mr. G. Bush, Claremont, N. H.; Mr. I. W. Hall and lady, and Mr. C. Gentilé, Chicago; Mr. and Mrs. Pearson, Pittsburgh; Mr. Doerr, Louis-

ville; Mr. W. W. Bell and wife, St. Louis; Mr. W. A. Fuller, New York; Mr. A. C. Austin and sister, Nashua; Mr. J. C. Dana, New York; O. H. Peck, Minneapolis; C. W. Motes, Atlanta, Ga.

The steamer reached Battery wharf on its return trip at 4.40 P.M., and before separating the members and their wives cordially joined in a vote of thanks to their generous entertainers. The Committee of Arrangements included Messrs. I. Wilton Hall, G. Waldron Smith, Wilfred A. French, W. A. Webster, W. H. Partridge, C. F. Conly and John Stalker.

MR. J. F. RYDER'S ADDRESS OF WELCOME AT BOSTON.

[Before the Boston Convention of the P. A. of A.]

Mr. President, Ladies and Gentlemen,—Twenty years ago, in this hospitable city was held the first Convention-Exhibition of the National Photographers' Association, the first meeting of an educational character held in this country, and the commencement of a progress in our art well understood by those who as members have profited by attendance. Now, after a lapse of two decades of "swinging around the circle," we return again to the "Hub," where, out of the rapid whirl, we may sit us down, and measure our strength and our acquirements with each other, and as against ourselves a score of years back.

A good number of the attendants of that former meeting are here again to-day, to see, to hear, to note the mile-posts of progress as we pass them in review over the road we have left behind, and to aim the focus of good resolution upon the possibilities of the future.

Another anniversary than of our twentieth year of meeting is upon us—the fiftieth of the existence of photography as a practical art, and its gift to the world by the generous discoverer, Louis Jacques Daguerre. Fifty years, in which has grown from the little mirrored plate, carrying a dim, uncertain image, the wonderful achievements of to-day. Portraits from life direct, the size of life, in such state of perfection and truthfulness as has never been attained by any other means. In landscape, the perfection of detail, texture and naturalness may be imitated by the painter's brush, the graver or the etcher's needle, but never can be equaled by them.

In the world of science it has become a lever of strength such as has not before been applied or known. By its means the moon is brought down into our very hands, and we can examine its features as we would the face of a man. We record with its help the phases of eclipse, transit, and other valuable phenomena of the heavenly bodies, and hold them as proofs and facts in astronomy which otherwise could not be shown.

We bring the bowels of the earth and the bottom of the sea into our hands and before our eyes for examination. We catch the zigzag lightning, the cannon ball in its flight. We are so much quicker than the limited express that we catch her on the run, showing the spokes of her drive-wheels as though she were standing still.

In medical science, by its aid the germs of disease are exposed and proven; the various stages of progressive disease are noted in the tissues, and secured as valuable knowledge to the healers of ailments in man and beast.

In the "Art preservative of Arts" it plays an important part. The short cut from the camera to the stereotyped plate, upon a cylinder press, by which means the important happenings of to-day may be shown in to-morrow morning's papers, is a stride in methods much appreciated in this age of progress.

I may say, the time is near when the wires which carry messages by electricity will also carry the photographic image from the camera of its birth to distant points, and it shall be possible for a sitting made in Cleveland to be transmitted by wire to Boston. I say from Cleveland, because the brain which has solved the problem and is engaged in perfecting the means, is in that city.

I must not take more of your time. To enumerate the facts and possibilities of photography would require the writing of a book.

I am proud to have conferred upon me the honor and privilege of welcoming this convention to its annual meeting, and I do now, in the name of the Photographers' Association of America, and in behalf of the photographers of this city, give you most hearty welcome to Boston.

REPORT OF THE PROGRESS OF PHOTOGRAPHY IN AMERICA DURING THE YEAR ENDING AUGUST 10, 1889.

BY W. I. LINCOLN ADAMS.

[Presented at the Boston Convention of the P. A. of A.]

PHOTOGRAPHY'S growth has been constant and rapid ever since its birth, fifty years ago.

During the year which has passed since our last convention much has been accomplished in photography in this country which especially deserves our consideration.

Several important improvements have been made in photographic objectives and apparatus; and these, of course, are followed by a better class of work. Better and cheaper lenses put it within the power of more photographers to turn out larger and finer productions; while improved cameras, stands, holders, printing frames, etc., make it easier for them to do the work.

The prices obtained by photographers for their work are not generally lower than they were one year ago, so that the downward tendency in the cost of materials results in slightly increasing their profits. Several attempts have been made during the year to form combinations for the purpose of artificially raising prices, the latest movement in this direction being the largest and strongest which has thus far been started. But photographers are learning, gradually, that a more effective way to prevent hurtful competition is to improve the quality of their productions rather than to resort to arbitrary combinations or lower the quality of their work in order to meet the prices of inferior operatives.

As the number of amateur photographers increases rapidly, the former distrust and prejudice on the part of some professionals seem to be giving way, and the two classes are therefore working toward the natural result of greater benefit to their common art and reciprocal aid to each other.

The problem of substituting for glass another equally transparent, but less fragile and lighter support, for carrying the sensitive bromide of silver, seems to have been successfully solved by the introduction of transparent celluloid films.

Mr. John Carbutt's "Flexible" films and the "Ivory," are undoubtedly a marked step in advance. They are as sensitive as plates and as easily developed; are not one-fifth so heavy, will not break, and require no stripping. Though they are at present somewhat higher in price than the glass plates, they will undoubtedly be considerably cheapened as the demand for them increases.

The Eastman Dry Plate and Film Company made a still further advance in coating celluloid sheets of sufficient thinness and length to be easily rolled on the roll-holder.

Celluloid has also been proposed as a substitute for ground glass in the focusing screen, and it seems to answer the purpose very well. A varnish composed of celluloid dissolved in acetate of amyle has been introduced, which works especially well with gelatine transfers. Celluloid has also been mentioned as an improved material, because of its lightness, for the manufacture of plate holders and even cameras.

Dry plates have been considerably increased in sensitiveness during the year, and are now made of a more uniform quality than in times past. Commercial orthochromatic plates are being quite largely employed for landscapes and copying.

With the magnesium "flash" light photographers have undoubtedly improved in their management of the light effect on a subject; but it can scarcely be said that this method of artificial lighting has increased in general use, especially during the latter part of the year. On the contrary, it is probably considerably less used now than it was one year ago, though those who do employ it are more skillful in its use. The tendency at present is to use magnesium powder in a pure state; and many ingenious lamps and devices for igniting and burning it have been invented.

Among developers hydroquinone has scarcely held its own, though for lantern slide purposes, window transparencies, and the making of "black-and-white" negatives for engravers, it continues to retain all of its old friends, and has probably added somewhat to their number. It has not been shown to be superior to pyro, however, in developing a briefly timed or under-exposed plate.

Hydroxylamine, though strongly advocated at first by a few, has been almost totally abandoned on account of the blisters which are invariably produced on the film when it is used. Two new developing agents have been announced, Eikonogen and Pyrocatechin, for which several advantages are claimed. Metabisulphate of potassium, as a more perfect preserver of pyro and hydroquinone in solution than a mono-sulphite, promises to be more widely used for that purpose.

In printing methods, though the platinotype, the bromide, the chloride print, and most conspicuously of all, perhaps, the collodion aristotype, has prominently come forward during the past year, albumen paper has not been largely superseded for professional purposes. Amateur photographers are attracted by the artistic dullness of plain silver prints; and cyanotypes, toned and untoned, seem to be gaining in favor with this large class of modern photographers. There has been a slight tendency shown among enlargers during the past year to return to the old method with iodide of silver, developing with gallic acid.

Lantern slides are being made more industriously than ever before; the International Lantern Slide Exchange, maintained by the photographic societies of Great Britain and our own country, keeping the interest active in this fascinating department of photographic work. In photo-mechanical printing methods there is nothing absolutely novel to report, though the excellent old processes are being more extensively used than ever before.

A new principle in heliochromy has been announced by Mr. Frederick E. Ives, of Philadelphia. He produces heliochromatic negatives by exposing color

sensitive plates through compound color screens, so adjusted that the curves of intensity which correspond to the action of light rays upon the sets of nerve fibrils that produce color sensation are clearly shown.

Photographic literature has been considerably augmented during the past year; three annuals, five monthlies, two semi-monthlies and two weeklies being published in this country at present.

Several important new books have been brought out during the year, and new and revised editions of excellent older works. More attention is being given by publishers to illustration, and photographers, as a class, are growing more studious.

Instruction in photography in schools and colleges has become more general. The Chautauqua School of Photography, founded three years ago, with a membership of only sixty-one students at the end of the first year, now numbers over one hundred and fifty members. The number of photographic societies has also been largely augmented during the year. There are now about seventy-five such organizations in this country.

In concluding our consideration of the progress which has been made during the twelve months, it seems fitting to speak at least briefly of those useful members of the profession who have gone to their rest.

Joseph Zentmayer and Richard Morrison, both able opticians, have ceased their labors in behalf of the fraternity during the past year. Marcus A. Root, one of the oldest daguerreotypists of Philadelphia; Anthon Baumgartner, the well known retoucher; Dr. Maurice N. Miller, photo-micrographist; David Cooper, an expert; D. U. Morgan, the albumen paper manufacturer, and Edward Anthony, photographic merchant, have also passed away. Their eminent services to the fraternity should be an inspiration for us who remain to labor more diligently and conscientiously than ever before; and if we exert ourselves in a manner at all worthy of the memory which they have left to us, we shall assemble one year from this time with still greater advances to report, and more encouraging prospects for the future.

PRESIDENT McMICHAEL'S ADDRESS—BOSTON CONVENTION.

Ladies and Gentlemen,—The Tenth Annual Convention of the Photographers' Association of America finds us in the beautiful City of Boston, remarkable in historic renown, celebrated in literature, and so wonderful in growth, both in its extent and beauty, that we may all find sympathy and encouragement in our present surroundings.

Many years ago willing hearts and hands were banded together for the best interests of the fraternity, and made Boston the birthplace of the first National Photographers' Association in America.

Like all pioneer societies, the old National Photographers' Association struggled against many difficulties, and was successful in sowing good seed from which sprang the present guild, which has had the most brilliant career of any of its kind.

It is indeed a pleasure to meet again after the separation that has intervened since our last Convention in the City of Minneapolis.

And now, fellow members, at this time, after our first warm greetings are over, allow me to congratulate you on the distinct indications I see around me of a renewal of old friendships and associations, with the prospect that many new ones

may be joined to that hand which will add vigor and luster to our future ; and I sincerely trust that our assembling here may be fraught with so profitable and cheering results that photography may no longer be a "fountain sealed" to us, but like the unfinished works of Raphael and Michael Angelo, may have an intrinsic value in themselves as "studies" for those who come after us.

The year through which we have just passed has been one of steady progress, which has yielded positive results in growth toward a higher standard of photographic work.

This latter part of my summary, however, does not prove satisfactory to photographers on account of the lack on the part of the fraternity to maintain a higher grade of work and demand better pay for their labors. I hope the time is not far distant when the photographers of America will stand shoulder to shoulder for the advancement of their mutual interests.

When we look around on every hand and see the innumerable societies of every kind, national, musical, educational and political, each united to impress the world with its strength and distinct characteristics, and then compare our own small numbers, we can safely tell the world that we know but little of union. We should take lessons from our neighbors in the art of standing together for mutual aid and comfort and the assertion of our rights, which is in itself a noble character.

But the attainment of any real good in life is dependent upon previous work, good, honest, persistent and even consecrated labor. "Nothing comes of nothing." In approaching this more serious and practical part of our object in the Association, sentiment for a time must give way to facts, some of which I would now submit in a statistical report :

In the year 1884 W. C. Armstrong turned over to G. M. Carlisle \$601.44, being the surplus from the five first conventions.

At the Fifth Annual Convention, held in Buffalo in July, 1885, the receipts were \$4,030.84, and the expenses of that year \$2,718.94, making a net gain of \$1,312.35 and leaving a balance of \$1,913.59 in the treasury.

In the year 1886 the receipts at the St. Louis Convention were \$4,054.40, disbursements, \$3,447.17, a net gain of \$610.23, and leaving a cash balance in the hands of the Treasurer, January 1, 1887, of \$2,528.57.

At Chicago in 1887 the receipts were \$6,000.10, and the expenses \$5,202.61, making a net gain of \$797.49, leaving a balance in the treasury January 1, 1888, of \$3,324.06.

At Minneapolis in 1888 the receipts were \$2,905.93, and the expenses \$3,311.16, making a net loss of \$405.23, and leaving a balance of \$2,917.93, January 1, 1889. It does seem that with so large a surplus in the treasury, the members do not receive all the benefits in an educational way that they are entitled to. I think there has been a tendency on the part of a majority of the officers to give too little thought to the education of members in art culture.

This year we secured the services of Dr. Edward L. Wilson for an art lecture, illustrated by a series of lantern slides, and also another evening's entertainment by Dr. Arthur H. Elliott on "Orthochromatic Photography," illustrated by studies from prominent workers, such as Boissonnas and Vogel of Germany, Eder of Vienna and Ives of Philadelphia.

But both were obliged to disappoint us on account of an unusual surplus of work.

I should recommend that the Association appropriate the sum of \$500 for a like purpose the coming year, so that to other than pleasant reflections may be added practical usefulness to art.

And now, brethren, the time draws near when I shall surrender into your hands the high authority with which I have been vested during my term of office as your President.

The exalted honor that it has been my good fortune to receive at your hands, the courtesy and kindness that has been manifested toward me by the officers and members of the Photographers' Association of America, cannot fail to be a proud and grateful remembrance, and I trust that my humble efforts have met with some degree of success.

THE TRANSPARENT FILMS.

BY G. D. MILBURN.

[Read before the Boston Convention of the P. A. of A.]

By this time, no doubt, all of you have heard of these films, although you may not have seen them. The advantages of them to the photographer over glass dry plates, and all other films already on the market, briefly summed up, are as follows: Superior transparency, greater flexibility, lightness, compactness, practicability of printing from either side of the negative, and lack of halation. The above six combined advantages are of such great importance that it must stamp this nitro-cellulose support as the very best basis to hold a sensitive emulsion, such as is required to make a perfect negative.

Heretofore non-transparency has been a great stumbling block to flexible films, but we can safely say that this is entirely overcome in Eastman's transparent films, for, as you see by our samples, they are about as transparent as glass.

The great flexibility of these films makes it possible and practicable to wind as many as one hundred exposures on one spool to be carried in one roller holder; in fact, experience has taught us that the best method to keep films of any kind absolutely flat during exposure is to strain them over a board from spool to spool, in the manner of the Eastman-Walker roll holder.

The films carried in this way make a view outfit very light. One gross $6\frac{1}{2} \times 8\frac{1}{2}$ "Eastman Transparent Films" and one of the same size roll holder will not weigh over 5 pounds, whereas one gross $6\frac{1}{2} \times 8\frac{1}{2}$ glass plates, and say about one dozen of the same size double plate holders, will weigh about 85 pounds, which makes the dry plate outfit weigh 80 pounds more than the transparent film outfit.

When these films are carried for exposure in this manner they occupy only about one-tenth part the space of the same amount of dry plates. Convenience of storage of the transparent film negatives for future use, as compared with the glass dry plate, is something you must all appreciate. These films are so thin that it will be possible to print from either side of the negative, and being so thin there will practically be no halation in the negative.

The backing of these films is impervious to water and unaffected by the chemicals in the developer; therefore there will be practically no contraction or expansion during the operations of developing, drying and printing from the negative, which makes them absolutely perfect.

The Eastman Company are pioneer workers in flexible film photography. They have, as you all perhaps know, introduced first negative paper; second, their American films, and now the very best of all their transparent films.

They have opened a new factory equipped for this especial work, and claim to have complete control over the quality of these films. Their improvement, by the addition of the single revolution audible indicator and intermittent marker on their roll holder for these films, makes this system of photography perfectly practicable for the studio and the field. One hundred exposures can be made and developed consecutively or singly at the option of the operator.

CELLULOID FILMS.

BY JOHN CARBUTT.

[Remarks before the Boston Convention of the P. A. of A.]

THE perfection to which the celluloid film has been brought at the present day shows a great achievement on the part of the manufacturers of them. But it has not yet arrived at its greatest perfection, although very much improved from what it was six months ago. The efforts to produce a substitute for glass date back some eight or nine years. Gelatine was the first article sought to produce this flexible film, and Rev. Mr. Palmer, of Liverpool, was one of the first in that line. N. W. Ferrier, of Paris, France, produced a double film of gelatine and collodion. The trouble was that the very thin film of collodion was not sufficient to support anything like the rigidity of the gelatine film. The gelatine film, having a desire to absorb moisture whenever it can get it, brought it out of plane. Then followed the making of the gelatine film, bleached by sulphurous acid, and then coated with emulsion; but that, during the manipulation of the chemical solution, became so softened that it was like handling a piece of wash leather.

Some three or four years ago my investigations in celluloid commenced. And since I have become a manufacturer of the article I have learned that I was antedated one or two years. So that I have to disagree with the gentleman who preceded me in the statement that Mr. Eastman was the one to produce, first, the transparent film. I was shown, in New York, in the office of Messrs. Anthony, a film said to have been made some five years ago on celluloid. And I have no reason to dispute that as being a fact.

Early in this year I had a piece of film submitted to me over 30 feet in length, of precisely the same nature as is now brought on as being the invention of Mr. Eastman. I have some of that film at my house; I haven't here, and the remainder was returned to those who sent it, because I was not prepared with machinery to use so thin a material. The absence of halation on the thin transparent film will depend a good deal on its backing. The film I now use can be used as well with a transparent as with a mat surface, as I am using both. So that the claim made by a rival manufacturer that he is the introducer of the transparent film is not good. The only claim that can be made is with reference to its thinness and adaptability to be wound on a spool. But as to there being any difficulty as to its not drying flat or giving trouble in printing, that is all nonsense. After the negative is washed off and put into a very weak glycerine bath and the surface afterwards rinsed off, the moisture in the atmosphere is counteracted, and it will give no trouble in printing. They can be printed from either side. We can show you an instance here where there are two proofs from one negative, and it will puzzle you to tell which is the right view of that picture, and which is printed in the ordinary way by direct sunlight.

The advantage of the film over the glass, I think, will be appreciated before long by the professional photographer. There has been some difficulty in the material not working satisfactorily. The manufacturers of it, as well as the maker of the film, have united their efforts to overcome a difficulty that has been supposed to arise from the camphor in the film. But from late experiments which have been made, I am glad to say that the matter has been brought to a practical issue, and that the difficulty has been entirely overcome. And I can say, although it is a personal matter to speak of it here—yet, as I am here to give all the information I can, I can say that which I have been turning out the last month is devoid of any defects whatever, any more than what there would be in any ordinary dry plate on glass.

The advantage of these films in transmission by mail is very great. I have orders that I have sent—well, I may say over all parts of the world, as far off as New Zealand, Australia, India, Corea, and wherever the mails reached; and I know that I have sent orders to China, also. This could not have been done with glass. The weight, of course, is a great consideration with travelers. I suppose fifty per cent. of the amateurs who go abroad this year take films with them in place of glass.

The use of the film among the profession, I think, will soon become common. Although I have no assurance from the manufacturers that the price of the raw material will be reduced very speedily, yet I think, from the recent sales they have offered us, that it certainly must come about. There are, at present, only two manufacturers of it, as I understand, in the country; and only one making the product which I have used, because the other was not in a state perfect enough for me to use. I would say that when I commenced the investigation of this, the largest piece I could procure was about 8 x 10 inches, and was very uneven and could not be made smooth. About last June, when I again sought the company, I found they had been able to increase the size up to 20 x 50 inches, but there was a good deal of the film that was still very imperfect. But they assured me of the high cost of the machinery, and the great care with which they selected the material.

It may interest you to know, as far as I am able to describe it, the way this celluloid is made. It is this: They buy the very finest of tissue paper, bleached as white as possible. That is nitrogenized. It is then ground up with camphor and pressed out into a large slab. After some evaporation has taken place, it is shaved off in thin slices and put into frames and stretched; taken down and put into a press, through which air is forced, and it takes about six weeks to cure it, as they term it. Then the finishing process is brought on, and my object in selecting and inducing them to manufacture it with a fine mat surface was to prevent halation, so much complained of in glass. And it certainly does effect that purpose. But I think by the transparent film, with either white or black backing—black would be preferable—that halation would be prevented. The cut film has this advantage, in my opinion, that larger sizes may be used, and they can be handled with a great deal more ease and rapidity.

At the close of Mr. Carbutt's remarks Dr. Elliott said: It is a well known motto, "Let him who merits bear the palm." Mr. Carbutt has very generously credited Anthony & Co. with the making of the first films. I happen to know that it was the old veteran, T. C. Roche, who had the first idea. T. C. Roche, of New York, was the man who had the first idea of using cellu-

loid in making films. But, somehow or other, it fell through. Since Mr. Carbutt spoke of it, I thought it was just as well to place the honor where it was due.

MR. BOGARDUS ON THE MUTUAL BENEFIT ASSOCIATION.

[Before the Boston Convention of the P. A. of A.]

Mr. President, Ladies and Gentlemen,—It gives me great pleasure to have an opportunity to explain to you the intentions of the Mutual Benefit Association. I find that it has been ridiculed, misunderstood and in every way wronged. For we have but one object in view, or I should not have touched it, and that is, the elevation and lifting up of photography from the low level into which it has descended. (Applause.) No one man, no ten men, no one hundred men, can do it. But the entire body, backing the men who have undertaken it, can do it, and we can control our business. Men in other professions, low professions, do control their business. And are photographers to stand still and see photography go down hill and down hill every year, and year after year, and do nothing to help it? If that is the case, I have misunderstood my companions. When I commenced making daguerreotypes, a good many years ago, it was a scientific business. A man who made a good daguerreotype was looked upon as somebody. The difficult, delicate, mystic art was considered something for a man to accomplish. It was not as it is to-day. Not everybody that could snap a camera could make a picture. It has been very amusing to me sometimes to have ladies come into my office and say, "Oh, you have no idea how well my Alfonzo is getting along! He even beats you professionals. He has got one of those cheap amateur outfits, and you have no idea how well he has succeeded. Our family cat was asleep in a chair one day, and he took the cat, and there was a little white spot on the cat's tail, and you could see—(Tremendous applause, laughter and cheers)—the white spot on the picture just as plain as can be." We did not have anything of that kind then. "His father is one of the directors of the grab-all bank on Wall street, and his father thinks of buying him a set of apparatus and setting him up in business because he has been so successful, because he has shown the white spot on the cat's tail." (Laughter.) I tell you we pioneers had to do something more than to show spots on a cat's tail. Photography is little understood to-day. I hear young men say, "You old fellows have a hard time making pictures. Just see how easy we do it. We just do this (illustrating) and it is all done, and if we do not develop in mother's pantry, all right, we take it around the corner to some snap artist, and he fixes it up for two shillings." The young men of our time did things in a very different way. It is the tendency to simplify all difficult things. By and by somebody takes it up and says, "Oh, see how easy we do it!" But the man who overcomes difficulties is the man to be honored.

Now, as I said, I found photography a good thing. My days are nearly numbered. I will not be with you much longer. I want to leave photography where I found it, and I am willing to work to bring it up to where I found it. And to that end alone I labor; and anybody who accuses us of selfish motives, does a thing which is too far beneath my notice for me to answer it.

I have prepared a paper here for fear that I might say something that I did not intend to say, or that I would leave something out that I did intend to say. You will excuse me if I read the paper.

I will give you a bit of "ancient history." The entire photographic fraternity had been hampered and hindered by the "bromide patent," until it became such a burden that some determined men, thinking it was time to put an end to such an expensive nuisance, called a meeting at Cooper Institute, New York, inviting all the men in the profession to meet them. This was in 1868, and I well remember the call for that meeting. It was signed by only seven (7) names, and two of them were Boston men, I. W. Black and George H. Loomis. That was the first time, to my knowledge, that these men had met each other, and had no other object been accomplished than the opportunity to get acquainted, it would be called a success. Coming from different cities, and well known to each other by name, yet it was the first time we had seen each other face to face, and I believe from that hour we felt a brotherly feeling before unknown. We felt that "men who made faces for a living, should stop making faces at each other." A committee was appointed with ample powers to bring about the desired result, and, as is usual in such matters, one man did the work, and that man is with you to-day, and I doubt if the fraternity ever fully realized the amount of research and labor he performed. I mean Dr. Edward L. Wilson. I need hardly add, the extension of the "bromide patent" was prevented.

Now we have another enemy to combat. It is an enemy with octopus arms, reaching in every direction; its slimy touch and deadly grasp is destroying our beautiful art. Different subjects require different treatment, and we do not believe that any committee or any one man can destroy or even curb this enemy. But we do believe that the whole fraternity combined can do it. Now is it worth the effort? Are the members of the photographic profession ready and willing to take hold of this matter and do it?

We well know that there are those who, from fear or cowardice, say it cannot be done. The men who have undertaken this work are neither blind nor deaf. We have seen all that has been printed and heard much that has been said, and it were better that some of it had not been printed or said. Some articles have been written by persons who, while confessing their ignorance of the inner workings of the Photographers' and Artists' Mutual Benefit Association, yet stab it.

It is interesting to see the effect the announcement of such an association has had on the incredulous. One thinks "It is a scheme of second-class artists to get some business and raise their prices." Another, "Designing schemes are at the bottom of it." Another, "I think it is the work of some labor agitator," and one writes, "The title is in bad odor with all but the few whose pockets the organization it represents is intended to fill." "Too aristocratic," says another. I like to see men have an opinion, even if it is adverse.

We have heard all these opinions (not very valuable), and to men endeavoring to do such a good work for the benefit of all, it has been rather galling.

The "yaller" dog becomes greatly excited, makes lots of noise, and disturbs the whole neighborhood in barking at the moon; but the moon goes right on, ruling the night, lighting up the world with its quiet splendor, and the dog as well. I have not done with the canine yet. Sometimes he does not venture out of his den, and there, with his body well protected, he risks only his head outside, and seems to think the noise he is making is enough to vanquish anybody, or if he sits outside, I have never heard of his mounting very high in his endeavor to inflict injury on his brilliant enemy. After tiring himself out, judg-

ing his efforts vain, he gives his longest, loudest whine in his highest key, and sneaks off with his tail between his legs, and if disheartened and discouraged he never admits it; and, after rotating around nothing for awhile, seems to forget his defeat, as John Bright once said, "In managing to make both ends meet." Beecher once said, "No great work for the benefit of mankind was ever entered into without disturbing somebody. The farmer, in plowing his field to sow the seed for the future harvest, disturbs some grubs and worms, but he must not stop because of that."

The subject of low prices has interested the whole profession, and yet nothing has been done to stop its ravages. No decided steps have been taken, as it was a very difficult subject to attack. Even in the Convention the subject was passed in the wish that something could be done, but no decided action toward doing it was taken.

Several gentlemen, after careful deliberation, have decided on a plan to place photography on a higher basis and at the same time to stop this rate cutting. To do this we need the combined efforts of all the reputable men in the profession.

With employer and employee combined this matter can be controlled. Thus both will be benefited, and the remuneration both are receiving will give them both what they should receive for good work; and this allowing anything and everything to pass because they cannot afford time to do their work well at the low prices prevailing will be stopped.

This cannot be done in a day; but it can be done, and done effectually, if the men in the profession will sustain the effort now made. It is a matter of life or death—or, if you please, of dollars and cents. If this effort fails for want of support, when or by whom will another attempt be made? It is now or never. Photography is low enough now, and this attempt to raise it failing, it is gone beyond redemption.

Are there those who wish this thing to continue?

Do they wish photography to keep on running down lower? Where would you have it? Instance fifty cents for re-sittings.

Now, here are reliable men ready to take the "bull by the horns," and some of those opposing it should be the first to favor it.

I will illustrate. An operator who worked for me in New York City told me how it is done: When a man comes in with his ninety-nine-cent ticket, they give him one sitting on a plate five by seven. I think it costs him seven cents. They seat him this way (illustrating), squint-eyed at first, on purpose. He does not like it after he sees the proof, and has to pay fifty cents for re-sitting. He pays his fifty cents for re-sitting, and they give him another one around on the other side. Fifty cents again for re-sitting. And if he gets anything at all, when the orders are finished he has to pay fifty cents for satin finish. That is the way photography is practiced to a great extent in New York to-day.

Zeal is good, but zeal without knowledge is like the "crackling of thorns under a pot," much noise with little result. But "none of these things move us"—we shall not turn back.

I confess when this matter was first presented to me I thought it an impossibility; but when I learned more fully its intentions, and saw the array of names ready to enter into the work, I said if such men combine and are backed by the respectable men in the profession it can be done, as such an association is well nigh impregnable.

From the immense number of names already enrolled, and the rapidity with which it is filling up, it looks as if it would soon be unanimous, and that is what we need for success ; with unanimity we can control this matter.

Men in other professions find it necessary to combine for their own protection, and are the photographers too blind to their own interests to endeavor to protect themselves ? One says, "I want to know how you are going to do it." Well ! to reveal our plans would be to forewarn the enemy and put him on his guard ; we cannot reveal what we propose, as different cases require different treatment. Would it be wise to tell ? Does the chief of police send word to the thief of his intentions, so that the light fingered gentleman may know what to expect ?

Another says : "Some part of it is secret, and I am not going to unite with it because I want to see all that is going on." Well, my friend, you would make a poor farmer ; you are not willing to risk your seed under ground out of your sight, because you wish to see it germinate ; that doctrine carried out would give you a poor crop indeed. The little onion seed must remain hidden from view where nature does her work, or you will fail to receive any return of fruit, or fragrance.

If, after joining us, you can show to the satisfaction of all concerned a better way, gladly will it be adopted. In my connection with it I have not found any one so tenacious of this plan as to be unwilling to employ another, if thought to be more efficient.

Sometimes we are propelled by the force of circumstances. Paddy, when driving the bull, tied the rope around his waist ; the bull began to run and Pat had all he could attend to in keeping up with his new leader. As he turned the corner some one asked, "Pat, where are you going ?" "That's just what I'd like to know meself," says Pat. "Ask the bull !" And so it is with some enterprises into which men enter. A man conducting a business finds it much greater than his most sanguine expectations, and instead of driving his business, his business drives him, and with such rapidity that he wonders where he is going and how it will end. If everything continues, as it became wider known, its numbers increased with such rapidity that they are now numbered by thousands, and its resources are formidable, and we sometimes feel like "asking the bull." All sources of danger are carefully guarded, and unless something now unseen prevents, its ends and aims will be successfully accomplished.

We say to stand still will not accomplish anything. If we try we have every prospect of succeeding. Example the dying Scotchman :

The old clergyman, while not willing to admit that gold would buy his passport into heaven, said : "I do not say that it would, but I do say it is well worth the trying."

An old Scotchman, who was very rich, was told by his physician that he would not live but a very few hours. The old man had attended more to the gaining of money than to looking after the interests of his soul. But when he was told that he began to get anxious, and sent for his old Scotch clergyman and said to him : "Dominie, if I should give five thousand pounds to some benevolent object, do you believe it would be the means of the salvation of my soul ?" The old Scotch minister did not want to commit himself and say that heaven could be bought with a man's money, but he did say : "I don't say it would, but I do say it is well worth trying."

Now, gentlemen, while we may not accomplish all that is desired, we do say "it is well worth the trying."

I want to answer a few things that I have heard since I came here. I had known that the newspapers had misrepresented the thing, but I had no idea that such ridiculous stories had been told about a thing that was calculated for the benefit of all. We have heard that stock dealers were against us because they thought we might boycott them, as the expression is. The word boycott, or the thought of it, has never, never entered into the calculations of the Association, never. Some of the leading stock dealers said to me this morning: "We are in favor of anything that will help photographers, and we are not responsible for the acts of our subordinates." Sometimes the authorized agents have said too much. It is just as if the clerk in your store should say a little more to a customer than he should have said without your knowledge and consent, and thus make an enemy of that customer. We find that has been done sometimes. We shall stop that by all the means in our possession.

I do not think I have anything more to say. I hope the Chairman will give our friend, Judge Cady, of Auburn, the counsel of the Association, who is present, an opportunity to be heard.

REMARKS OF JUDGE CADY.

Ladies and Gentlemen,—Of course I know what you expect me to talk about. There is only one thing that I can discuss that will be of interest to this Association, of interest to the photographers here; and that is the subject of the Photographers' Mutual Benefit Association. I am not a photographer by profession. I am, as has been stated, the counsel of the new association, the Photographers' Mutual Benefit Association.

Some time ago several leading photographers in the country joined together in consultation over the question of how they could better the situation of photographers. They saw that the prices were being cut to such a degree as not only tended to ruin the men who were in the business in a financial way, but to degrade the profession in the estimation of the public. They saw that the members of the profession were gradually losing respect for themselves and respect for the profession they ought to honor. There are men in the profession, and there are men out of it, who look upon the profession of photography as a very honorable and a very high and lofty profession. There is no science, no profession, that is not largely indebted to the profession of photography. There is no science that has benefited mankind that is not largely indebted to photography. (Applause.)

And the public ought to be educated, as well as the photographer, to respect and look up to the profession of photography. It ought to be treated as a profession, and not as a mere manufacturing business, with the members engaged in working for only one object and that to see how large an output they can make. It ought not to be treated as manufacturers treat their business—large products and small profits. It ought to be treated as a profession, and the photographers themselves ought to show that they have respect for their skill and for their profession. Think of a man advertising under the picture of a rooster, advertising and boasting of his great skill, of being capable of making the finest pictures, of being the most skillful of photographers, and then winding up by an offer to the good people who will be kind enough to patronize him, of the very best

photographs for ninety-nine cents a dozen. Offering his skill for ninety-nine cents a dozen, and at the same time boasting of his skill, after offering it at such a ruinous sacrifice. (Applause.) I might call your attention to one advertisement that I have here : " For thirty days, our five-dollar cabinet photos, ninety-nine cents per dozen." And I may say to you further that the very man who issued that advertisement,*since issuing it and since sending out his dodgers all over the city where he was located, has been induced, after a fair presentation of the situation, and after being shown—for he happened to be a man of reason, after all—after being shown that he was doing injustice to himself as well as to the profession ; he has been induced to join this Association, and has thrown away his dodgers and has now gone back to reasonable prices for his work. (Applause.) The men who organized this Association thought it feasible to get photographers to combine together, not as a trust, because a trust, as you understand, proposes to concentrate everything into one center, one point, and control the business of everybody who is interested in that trust. This Association does not propose to do any such thing. It does not propose to control any man's business. It simply proposes to do everything it possibly can to persuade him to honor his profession, and not, under any circumstances, to degrade it. It proposes to get into its membership the best men in the profession, and to increase its membership to such a degree that it shall be an honor to a man to belong to it, so that it shall be a credit to him and not a discredit to be a member of the profession. It is a mutual benefit society. It proposes to work for the mutual benefit of all. Now, I was consulted with reference to the proper mode of organizing the Association, and that is the way I became interested in it. Steps were taken by which it was incorporated under the laws of the State of New York. And it was organized in this manner : The Association is known, as you understand, as the Photographers' and Artists' Mutual Benefit Association. The Grand Council of that Association, which is only the Executive Committee of the Association, is incorporated under the laws of the State of New York, so as to be able to do business and transact all the affairs of the Association. It has a Constitution and By-Laws governing its mode of transacting business which are binding upon its officers, holding them to the strictest accountability for every pecuniary and every other business transaction. Its Treasurer, who has charge of all of the funds of the Association, is obliged to deposit the funds in a reliable banking institution, and is obliged to receipt for the funds and obliged to give bonds for the faithful performance of his duty. You who know the present Treasurer, will know that he himself would be an ample bond for the faithful performance of his trust. (Applause.)

It has been suggested by some that this is a money-making scheme ; that the men who are devoting their time, night and day, to carrying out this plan and effecting the benefits which they have undertaken to accomplish, are doing this work for pecuniary gain. I want to say right here to you that there is not an officer of this Association who has received one single dollar for any of the work he has done. And I know it is the purpose of this committee not to accept, under any circumstances, a single cent for their work until the work has been accomplished and the benefits have been seen by the members of the Association. (Applause.)

Now, it has been suggested to me that there has been a claim on the part of some people that this was going to be a boycotting institution—that it was

going to crush people. I want to say to you that that is not the purpose of the Association at all. If a man does not want to join this Association, he need not come in. They do not mean him any harm if he does not join the Association, if he will only do what he can to uphold his profession. They do not mean to boycott; and they do not propose to indulge in boycotting or dynamite to carry out the purposes of this Association. I have seen men who were stubborn converted more quickly and easily by kindness than by harsh treatment. There is not a single man in this profession, so far as we have been able to learn through all our agents—there is not a man in the profession who has been approached, but what said, “You are in a good work; it ought to be done. I will do all I can to help you about it.” Now, if they will only do what they say they will. But many men take that view who do not join. They say, “You are doing a good work. I hope you will accomplish it.” If they only mean what they say and will join in the work of the accomplishment of it, the desired result will be brought about without resorting to any harsh treatment of any kind. This Association does not propose to resort to violence. It proposes to do its business in a strictly legitimate and honorable manner in every respect. And I believe that it will become popular for the members of the profession to belong to this Association.

Now, its purposes, its objects, have been already stated in the journals. The first object, the main object, is to stop the ruinous cutting of prices and to establish a higher grade of equitable prices, and thus secure enough compensation to the photographer to enable him to do first-class work. And they propose to make it so popular that persons will be obliged to serve a three years’ apprenticeship, and to have a certificate of service from the master before being qualified to engage in the profession. (Applause.) It proposes to organize a bureau of information for the employer wishing help and for the employee wishing a position. It proposes to organize secret service—it already has. And I may say to you now that many persons have secured positions through the agency of this Association, and many persons desiring help have secured help through the agency of this Association. There are other purposes which this Association has in view. It proposes—and that is above all other things—it proposes to cause a better state of feeling to exist among the members of the profession than exists to-day. And it proposes to raise the profession in the estimation of the public.

I might call your attention to some of the provisions in the Constitution and By-Laws. But I must be brief. I simply wish to assure you all that the purposes of this Association are good; that it does not mean to inflict any harm upon anybody, but means to elevate the profession, and to do everything that it can possibly do to raise the standard of prices where they ought to be raised.

The “Annual” is selling like wildfire, over 1,400 copies being sent out the first day of publication (in England).—*Photography*.

The “Annual” contains all the usual tables, and in addition several new ones specially compiled for it, that cannot fail to find favor with many readers. Taking it all in all, we must congratulate both editors and publishers on the appearance and value of the “Annual,” and assure our readers that if they would keep it always within reach, they would often find it a friend in need.—*Photographic Beacon*.

THE AWARDS OF PRIZES AT BOSTON.

THE grand prize, bronze figure of the "Roman Wrestlers," for best illustration of Evangeline, was awarded to J. E. & O. J. Rösch, of St. Louis.

In Class A four gold medals for genre photographs were awarded to O. P. Scott, Chicago; G. M. Elton, Palmyra, N. Y.; L. S. Stein, Milwaukee, and J. E. & O. J. Rösch, St. Louis.

In Class B, portrait photography, one gold medal was awarded to L. M. Baker & Co., Columbus, O., and two silver medals to J. H. Doerr, Louisville, Ky., and W. Stuber & Bro., Louisville, Ky. Also two bronze medals to D. Rad, Coover, Iowa City, Ia., and A. H. Hardy, Boston, Mass.

In Class C, landscape photography, one gold medal was awarded to George Barker, Niagara Falls, N. Y.; one silver medal to W. H. Jackson, of Denver, Colo., and one bronze medal to Wilfred A. French, Boston, Mass. In same class, one silver medal was awarded to Henry G. Peabody, of Boston, for marine views, and one silver medal to A. L. Bowersox for architectural views.

In Class D, silver medal to A. V. Chryhan, Chicago, and bronze medal to T. Heinig, for retouching.

In Class E, silver medal to Eastman Co.

In Class F, silver medal to Eastman Co.

In Class G, foreign pictures. One gold medal to F. Müller, Munich, Germany, and one silver medal to Mendeholson, of London, Eng.

For improvements in apparatus, one bronze medal to the Scovill & Adams Co.

The Eastman Prize Cup was awarded to E. Decker, of Cleveland, O.

OUR ILLUSTRATION.

THE handsome photo-gravure with which we illustrate this issue of the BULLETIN is from a negative made by Diaz and Spencer, of Santiago, Chili. Such a galaxy of beautiful faces is seldom seen, and the photographic skill of our Chilian friends is well exhibited in the artistic grouping of the heads. It is in many ways a fine testimonial to the excellent work of our South American friends; the fine management of light and shade to secure good modeling in the various faces, and the skillful work upon the negative to secure the best values in printing, speak better than any words of ours for their artistic skill.

BLISTERS.

BY P. C. DUCHOCHOIS.

It is astonishing how good processes soon fell into oblivion! I will resuscitate one.

In "What Our Friends Would Like to Know" I often read queries like this—"Would you inform me what causes the blisters on albumen paper, and which is the best remedy?"

The cause? It is the same, I think, which makes the paper repel the silver solution—oily drops—that is, the small percentage of salt in the albumen solution. I never noticed blisters, when, years ago, I prepared my own highly albumenized paper with 4 or 5 per cent. of ammonium chloride, the film remaining somewhat spongy when made insoluble in contact with silver nitrate. Of course the silver solution had to be made stronger than it is used now, but the proofs were more brilliant, perhaps, and certainly more permanent.

The remedy? Many are advocated, except the good old one. It consists of simply preparing the silver bath with aluminium nitrate, which also prevents the paper from turning brown in damp, warm weather. The formula is as follows:

Nitrate of silver	50 grains.
Nitrate of alumina	10 "
Water	1 ounce.

Before toning the proofs should be carefully washed.

This process was given to me in 1870 by a good friend, the late Mr. H. T. Anthony.

THE WING CAMERA.

To the Editors of the BULLETIN:

DEAR SIR,—In your report of meeting of June 11th of the Society of Amateur Photographers of New York, you give description and cut of a camera exhibited by Mr. Beach and made by S. Wing & Co. I wish to say that the double slide motion to the front, made as shown in the cut (without the measures), was put on some cameras sold several years since. I happen to know that W. H. Jacoby, of Minneapolis, had one, 18 x 22 size, and W. H. Jackson, Denver, Col., its twin brother. The lens moving in universal socket joint was shown many years ago by S. A. Holmes, of your city.

Innumerable clamps for the beds for cameras have been made, bolts in the edge of the bed, old in England, but revived and patented here by another party, but I have used for some time the hook clamps on a fairy camera bought from Messrs. Anthony, and find them nearer perfection than any others I have seen. I propose a camera wherein the bed folds underneath and around the base of camera, turning up in front. When straightened out and fastened to the top of the tripod it will be held perfectly rigid and need no clamp whatever. Have several holes bored in the top of your tripod, so you can have the center of gravity over the center of support. When a camera is extended, I find that the bed needs holding up and not down.

Those who take cameras to be shown before societies, should see that they have some original points about them, and are not resurrections of old articles that have been worn out and laid aside among the bric-a-brac and curios for future generations to wonder at.

Yours truly,

ABE LIZZARD.

P. S.—When I saw the cut in BULLETIN, I felt as if A. Blizzard had struck me.

August 2, 1889.

The contents of the "Annual" are exceedingly rich. I congratulate you on your progress, and you have my fullest acknowledgment for such an estimable enterprise.

VICTOR SCHUMANN (Leipzig).

I think the "Annual" is beautiful; it could not be surpassed, either in contents or binding. I shall ever have it among my most valued books.

A. E. DUCKHAM (Cornell University).

The "Annual" is a remarkably interesting and attractive volume. The articles contributed are of great value to all photographic workers, and the paper, printing and binding exceptionally good.

FRANK H. HOWE (Columbus).

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

CHICAGO CAMERA CLUB.

A SPECIAL meeting of the Chicago Camera Club was held at the Club rooms, No. 182 Wabash avenue, Monday evening, July 29th, and was largely attended. President Williston called the meeting to order, and stated that the special business of the evening would be a demonstration of the new Eastman Transparent Film, which was destined to revolutionize photography, and thereupon introduced Mr. Seth C. Jones, the genial representative of the Eastman Company.

Mr. Jones, after a few well chosen remarks, explained the new process at length, and exhibited several fine specimen negatives and prints from the new film, announcing that the erection of a complete new factory and improved machinery had delayed its manufacture, but that the company hoped to supply the dealers in about two weeks.

The room was then illuminated with red light, and Mr. Jones producing an exposed roll of the new film, clipped off several exposures, and in a few moments some beautiful negatives were made and passed around for examination. The mode of operation

was the same as with glass—less care, if anything, being used in the manipulation.

The process was voted a great success by all present, and Mr. Jones was tendered the thanks of the Club.

The Secretary announced the presentation of a complete enlarging outfit by Mr. F. K. Dunn, a member of the Club, after which the meeting adjourned informally to inspect the new rooms of the Club, which we will briefly describe.

Upon entering the building (which is in the heart of the city), the elevator lands you at the door of the Club. Here you find a large and beautifully lighted reception hall and library room, capable of seating about one hundred persons, carpeted and furnished throughout in antique oak. A large and well selected library of photographic literature is being constantly added to, and the walls are adorned with masterpieces of both foreign and American amateur and professional work. The gas chandeliers, by a new device, are set on pivots so as to be readily set aside when the room is used for lantern exhibitions.

An easy staircase leads from this room to the work rooms above. The first thing which meets the eye of the visitor is a large and perfectly appointed studio with complete skylight, portrait camera and lenses, and accessories. From this doors lead into dressing rooms, dark rooms, enlarging, printing, silvering and finishing rooms and laboratory, completely stocked with chemicals for the free use of members. These rooms are completely furnished—a regularly appointed studio gallery, in fact—and all contained in a structure which is erected upon the roof of the building, where light, air and water are abundant. The Club is meeting with great success, and the members are enthusiastic and working hard to make it the most complete amateur photographic society in existence.

Members of other camera clubs and photographers in general are invited to inspect our new quarters.

The Rev. M. L. Williston, President of the Club, will attend the Boston Convention, and will be glad to meet the fraternity.

FRED. K. MORRILL,

Secretary.

WHAT'S IN A NAME?—A well known business house in Buffalo bears the title "Irish & English," and as to their nationality—Irish is an Englishman and English an Irishman.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

SEMI-CENTENNIAL CELEBRATION OF PHOTOGRAPHY.—TENTH ANNUAL CONVENTION, AUGUST 6-10, 1889, MECHANICS' HALL, BOSTON, MASS.

First Session.

August 6, 1889.

The Convention was called to order at 11 A.M., by *President* McMICHAEL.

The *President*—*Ladies and Gentlemen*,—It is our good fortune to have with us this morning our mutual friend, the first President of the Photographers' Association of America, who will welcome you to the Tenth Annual Convention of this Association and to the first semi-centennial of Photography.

I take great pleasure in introducing to you Mr. J. F. Ryder, of Cleveland, O. (See Address, page 490.)

The *President*—On behalf of the members of this Association, I sincerely thank you for your kind welcome.

Ladies and Gentlemen,—We have with us this morning the Mayor of the City of Boston, but, on account of the anticipated visit of the President of the United States to the city tomorrow, he is unable to say one word. Consequently I will ask you to excuse him now. (Mayor Hart then withdrew.)

I now declare the Tenth Annual Convention of the Photographers' Association of America open and in order for business. The first order of business is the calling of the roll of members. It has been customary, heretofore, to pass over that order of business, on account of its taking so much time. If there is no objection, we will pass this order of business.

The next in order is the reading of the minutes of the last meeting. If there are no objections, we will pass this in the same way.

The next in order is the report of Standing and Special Committees, which the By-Laws say shall be read by their titles or in full. I believe there is a report of the Standing Committee on the Progress of Photography, by Mr. W. I. Lincoln Adams, editor of the *Photographic Times*. (See page 491.)

The report of W. I. Lincoln Adams was accepted, and a unanimous vote of thanks was tendered Mr. Adams for his valuable paper.

The *President*—Are there any more reports of Standing and Special Committees? If not, the next order of business will be the selection of a location for the Convention of 1890.

Mr. GENTILÉ—Mr. President, I will place before the Convention the name of Washington, as being a very suitable place. A large number of photographers have, for several years, wished to go and see the Capital of the United States, one of the most beautiful cities in the Union. And I think it would be very proper to hold our next Convention there. I am confident that you would get a large number of visitors from the West; and, of course, it being near the East, we would have a very large meeting. It ought to be at a season of the year that would be suitable, so that we might get a large attendance. There is every convenience for holding the Convention there, and I think the Government might be induced to loan a fine exhibit.

Taking all things into consideration, it would be one of the finest things we could do to meet at Washington.

Mr. MOTES (of Atlanta, Ga.)—I second the motion.

Mr. W. V. RANGER.—I offer the name of Detroit, as being the most centrally located and convenient of access to members both from the East and the West. I suppose it is not necessary to say anything about the beauties of the place. It is one of the handsomest cities in the United States, and one of the most handsomely situated. And it is easy of access from all points.

Mr. RYDER—I would be very much pleased at a successful meeting for 1890. I fancy, however, that Washington, at the time of the year that we meet, is uncomfortably hot. It is almost deserted as a city, in such respects as would give us real interest; and I think it is not exactly the location that we should choose. I should favor Detroit, or I should favor Buffalo, the place where we have been eminently successful.

A Voice—What about Cleveland?

Mr. RYDER—The trouble with Cleveland is, that we have no exhibition hall in that city. I should be very much pleased to have you meet with us in Cleveland if we were prepared to receive you. But that not being the case it is rather out of the question. I feel rather favorably disposed to Buffalo. We have had fine success there, and it is some years since we have had our meeting there. The people there know well how to handle a Convention, and I would suggest that as a proper place.

Mr. MOTES—In behalf of the Southern photographers I would like to urge the City of Washington as best prepared and most convenient of access. Buffalo is a nice place, but

it is too far away for us at the South. The photographers in the South will not go so far. I was in the City of Washington last Sunday, and I think it was the most beautiful day that I have experienced in a long time, pleasanter even than this day is here; and I think we could bear with the heat very well. I feel sure that there is enough of interest there to entertain us while we are in the city. It being a central point, it is convenient for the East, North, West and South; and it is a place where many photographers would be glad to go for the sake of seeing the Capital City. It is my honest opinion that we would have the largest Convention there that we ever had. I take special pleasure in seconding Mr. Gentilé's motion in favor of Washington.

Mr. PULLMAN—As to Washington, I do not think the warm climate of Washington ought to scare any one. I think the statistics of the temperature of Washington will compare favorably with those of many cities much further north. I have been a resident of Washington since 1864, and I do not know that I have experienced any more discomfort there than I used to when I lived much further north, as a rule. As a resident of Washington, I should be very glad to do what I could to welcome the Association there. And I think that the people of Washington would be pleased to have the Convention held in that city.

Mr. FOWLER (of Michigan)—When I came here I just mentioned the word "Detroit" to quite a number of gentlemen here, and you ought to have seen their faces. They were fairly luminous. I desire to urge the advantages of Detroit as the next meeting place of the Association. Some of us think Michigan is about the center of the world, excepting Boston, of course.

I would be very much in favor of Detroit, and I know that very many other people would also. (Applause.)

Mr. MORRISON—Before coming to the Convention I was very much impressed with our own beautiful city in the State of Ohio, as the next and best place of meeting. Since coming, however, I think from what I have learned that our room is not ample. So I am in favor of Washington; because I do hate to attend surprise parties. I do not like to go to a place unless I am invited. I think that would be the case if we tried Michigan; it would be a surprise party, and we should go not knowing whether we should be received, because there is no invitation. If we go anywhere else than to Washington we go without any

invitation. Let us go to Washington, where one of the members has invited us. I think that is the place to go. I think we should all enjoy it, because we are invited to go there.

The *President*—It makes but little difference to me where the Convention goes next year. But you have all got a standing invitation to go to Buffalo, any time—always. (Applause.) Are there any more remarks? If that is all I declare the nominations closed, and the Secretary will prepare the ballots.

Mr. CARBUTT—Mr. President, as there seem to be more advocates for Washington than for any other place, and as it may save time that would be spent in balloting, I would suggest a rising vote for Washington. And if the President cannot decide that it is largely in the majority, then let a ballot be taken. (Motion seconded.)

Mr. ADAMS—How about Buffalo? I do not wish to say much, but I hope the gentlemen here will think well before they go to Washington at the season of the year when our Convention is to be held. I have no choice myself between Cleveland, Detroit and Buffalo. But I understand there are not sufficient hotel accommodations at Detroit. Cleveland is certainly not prepared to receive us. And if Buffalo is the place, I am satisfied that the Convention will be a success.

A *Member*—I believe, according to our Constitution, we have to vote by ballot, and I cannot agree with Mr. Carbutt that a majority are in favor of Washington. At this season it will be uncomfortably hot. Now, in regard to Mr. Adams' remarks, I understood him to say that there are no accommodations in Detroit. I believe they are building a very handsome public hall that is ample to accommodate the Convention. And Detroit is one of the finest cities in the United States.

Mr. ADAMS—I did not quite say that. I said I understood they were not quite prepared to meet our requirements in hotel accommodations. At another time of year I would say Washington by all means.

Mr. CARBUTT—My suggestion was not made because I was prejudiced in favor of Washington. If anything, I am in favor of Detroit. I understand they are building a hall there. I made the motion because I knew in previous meetings that has been the objection. I withdraw that motion and let it go to ballot.

The ballot was then taken, and Messrs. Guerin, Stanton and Robie were appointed tellers.

The *President*—The result of the ballot

shows: Buffalo, 33; Detroit, 55; Washington, 48. (Great applause.)

Mr. CRAMER—I move that the vote in favor of Detroit be made unanimous. (Motion seconded and unanimously carried.)

The *President*—I appoint as the Committee on Nominations, W. H. Robie, F. W. Guerin, W. G. Entrekin, S. J. Dixon and George Barker.

The last order of business before closing the first meeting will be the President's Annual Report. If there is nothing else, I will read that report now. (See page 493.)

The *President*—On Saturday the photographers and dealers of Boston will tender the visiting photographers an excursion of one hundred miles out on the water, and they wish you all to be there.

I am also requested to announce that Mrs. Benjamin French will be pleased to entertain any members of the Association from seven o'clock each evening until eleven.

I have also received the following telegram from London :

"President Photographers' Association of America, Boston :

"Heartly congratulations from the Photographers' Convention, United Kingdom.

(Signed) BRIGINSHAW."

Mr. GENTILÉ—In Paris, France, the Congress of the Photographers of the World are holding their first meeting. I think it would be very becoming on the part of this National Association to send them congratulations, especially as this is the celebration of the semi-centennial of the discovery of photography by a Frenchman. Therefore, I move that we send a telegram congratulating them.

Mr. DEFÖE—I would suggest that the maker of that motion incorporate in it that a reply be sent to the telegram just received.

The *President*—It has been moved and seconded that the Photographers' Association of America send congratulations to the Congress of the Photographers of the World which meets in Paris to-morrow. (Motion unanimously carried.)

Mr. ADAMS—I think the action should be more official than that. Therefore, that the President of the Association be the Chairman of that Committee to send those telegrams. (Motion seconded and carried.) The following committee was appointed: The President, Mr. Cramer, Mr. Ryder, Mr. Gentilé and Mr. Carbutt.

Mr. FOWLER—I think that we are all of the opinion that this meeting should be made a success socially. We are all glad to meet

friends and shake their hands. And I think we should do all we can in this meeting to get acquainted with each other. This badge is all that is necessary for an introduction, it seems to me ; and at future meetings when we come together, if we can be acquainted and grasp the warm hand of friendship, we shall thoroughly enjoy these meetings. I think a great many are acquainted now. I do not know very many; I should be glad to get acquainted, and I think there are a great many that would, especially at this semi-centennial meeting. I speak of this at this first meeting so that we can proceed to get acquainted.

Dr. ELLIOTT—I wish simply to remark that we will have ample opportunity to get acquainted on Saturday, if you will all go.

Mr. APPLETON—The matter of accepting the President's report was overlooked, I believe. I move you, therefore, that the President's annual report be accepted, and a vote of thanks be tendered to him. (Motion seconded and unanimously carried.)

Mr. CRAMER—Before adjournment I would like to say a few words. Upon my recent visit to Europe, I met two former friends of ours, Dr. Vogel, of Berlin, and Mr. J. Traill Taylor, now connected with the *British Journal of Photography*, in London. I found both gentlemen happy and in good spirits, and they think very highly of the fine time they spent with us while they stayed in the United States, and wished to be kindly remembered to all the friends and members of the Association.

A Member—Before we adjourn I would like to make one motion. I think we are a little partial in our vote of thanks. The first President of the Association gave us a very fine address, and I move a vote of thanks to Mr. Ryder.

The *President*—A vote to that effect was passed.

(The Convention then adjourned, to meet at 10 A.M., Wednesday, August 7, 1889.)

Second Session.

BOSTON, August 7, 1889, 11 A.M.

President MCMICHAEL—The meeting will now come to order. The first business this morning is the reading of communications.

The Secretary then read the following communications :

"Le Congres des Photographs, Paris :

"The Photographers' Association of America now assembled, in Boston send cordial congratulations.

H. MCMICHAEL,

President."

"50 Bromfield Street,
BOSTON, August 6, 1889.

"The Boston Camera Club begs to tender congratulations to the Photographers' Association of America on the auspicious opening of the Tenth Annual Convention and the semi-centennial of the discovery of Photography.

(Signed) GEORGE E. CABOT, *President*.
EDWARD F. WILDER, *Secretary*."

"DENVER, Col., August 5, 1889.

"H. McMICHAEL,

Photographic National Association,
Mechanics' Building, Boston.

"Greeting from the Rockies. Sincerely regret I cannot be with you, as this will surely be the grandest meeting in the history of the Association. Hope you will meet again East of the Mississippi, and in 1891 come to Denver.

(Signed) W. H. JACKSON."

The *President*—If there are no further communications under this head, we will pass to the unfinished business. Is there any unfinished business to come before the Association this morning? If not, the report of the Committee on Nominations is in order. Mr. Robie not being present, the Secretary will read the report.

Secretary SCOTT then read the following report:

BOSTON, August 7, 1889.

Mr. President and Members of the Convention:

Your Committee appointed to nominate officers for the ensuing year begs leave to submit the following names:

For President, J. F. Ryder, Cleveland, O.; 1st Vice-President, O. P. Scott, Chicago, Ill.; 2d Vice-President, W. G. C. Kimball, Concord, N. H.; Secretary, H. McMichael, Buffalo, N. Y.; Treasurer, G. M. Carlisle, Providence, R. I.; Nominating Committee: W. H. Robie, George Barker, W. G. Entrekin, F. W. Guerin, S. J. Dixon.

The *President*—The manner of choosing the judges this year is as follows: "The President will name a Chairman from the competitors of each class. They shall call a meeting of the competitors, who shall select three judges for each class." These are not judges. Each of these gentlemen is one of the exhibitors in each class, and they are to choose their own judges. And it is better that they should act at once just as soon as this meeting is over, because the judges will want all the time possible to look over the pictures.

The following were appointed Chairmen: Class F, James M. Doerr; Class E, E. Decker; Class D, Theodore Heinig; Class C, George Barker; Class B, W. Stuber; Class A, G. M. Elton; grand prize, C. W. Motes.

If there is no further business, we shall have to close.

Mr. GENTILÉ—I understand that there is a very strong feeling about going to Detroit, as we decided to do yesterday. I would move you, sir, that we reconsider the motion made yesterday to go to Detroit. I would say that I have been informed that the exhibition building there is many miles away from the city. I think, under those circumstances, and as a great many people seem to be dissatisfied with it, the matter should be brought up again.

The *President*—Do you know how many miles away from the city the exhibition building is?

Mr. GENTILÉ—I do not know anything about it, and so I think we should ask somebody who knows about it.

Mr. ALLEN—It is 7 miles.

Mr. GENTILÉ—They also say that the hotel accommodations are not adequate for the large number that would attend.

(Motion to reconsider was seconded by Mr. Guerin and carried by a rising vote.)

Mr. HOOVER—I move that we select Buffalo as the place for the next meeting.

The *Secretary*—I move you that we select Washington as our next place of meeting. I believe we can have a larger attendance in Washington than in any other place in the Union.

The Secretary's motion was seconded by several members.

Mr. GENTILÉ—I am satisfied that if we go to Washington we will have an immense crowd there. We can go there in July and have as good weather as we have here to-day. It is very seldom that they have extremely hot weather there. As far as accommodations are concerned, they have ample. Some say that they do not want to go there when Congress is not in session. I do not think that has anything to do with it. It would be better for us to go when Congress is not in session. We will get more advantages. And the fact of there not being any stock dealers there has nothing to do with it. We do not want to go to any city as beggars. This institution is rich enough to pay its own way to all the entertainments that it desires to carry out. We ought to be able to go to any

city and carry out anything we undertake, ourselves. It is not necessary for the photographers to get up any entertainments for us. In many instances it would be quite a drag on them. I do not think they would care to do it. But we should find plenty of entertainment in Washington. There are a great many places of interest there. And I am sure you would have large delegations from the South and West, and I think, also, from the East. I think everybody would be perfectly satisfied to go there.

Mr. RANGER—In regard to location, the extreme points for holding the Convention have not been a success. One year ago it was held in Minneapolis, an extreme point; it was not so successful there. We are holding it this year at an extreme point. It is not so successful as at Chicago or at Buffalo. The more central the point of holding our Conventions, the more successful, financially, they are. I think the most profitable one we have ever held was in Buffalo. The next most profitable one was in Chicago. And if we go to Washington in July or August it is extremely hot. It is possible we might strike it at a time when it was quite comfortable, but that is the exception and not the rule. It is much warmer than it is here. And I do not think that photographers from here, from the West and Northwest, will go so far as to go to Washington. They do not come to Boston, where we have one of the best chances for exhibition, one of the finest places to visit in the whole country. Look at the attendance here as compared with the attendance at Chicago and Buffalo.

I second the nomination of Buffalo.

Mr. PULLMAN—I have been a resident of Washington since the year 1864. I have spent nearly every summer in Washington, and I think it is a mistaken idea that the temperature there is so high in the summer

months, or that it is uncomfortable. I would as soon spend my summers in the City of Washington as any place of which I know. We have wide streets, well ventilated streets, and shady streets. Then it is the Capital of the nation, and a great many with whom I have spoken have expressed a strong desire to go to Washington. There are many points of interest there that can be better seen in the summer months than at any other time. Some think that they do not care to go to Washington except when Congress is in session. Any one who has been to the Capitol when Congress is in session once has had enough of it, unless he has a different appetite from what I have. It is worse than a country school-house—confusion worse confounded—unless some honorable member is making a set speech. You cannot hear one word out of one hundred that are spoken. It is all business and is of no interest to visitors. Then, again, there are places of interest, even in the Capitol building, that are easy of access when Congress is not in session, access to which is denied the general public when Congress is in session. The Governmental departments and various places of interest there are more accessible, because there is less work thrown upon the clerks at that time. There can be more courtesies shown to visitors. Of course there are more hotel accommodations in the summer season, and they will give cheaper rates. I think, individually, while I cannot promise what the photographers will do, that they would interest themselves and do well by us. I know you would receive a hearty welcome, and I think you would get a larger attendance in the City of Washington than in any other place in the United States. (Applause.)

(To be Continued.)

OWING to the pressure of matter from the Boston Convention, the columns "What Our Friends Would Like to Know" and "Views Caught with the Drop Shutter," are crowded out of this issue of the BULLETIN.

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YELLOWSTONE NATIONAL PARK

ANTHONY'S Photographic Bulletin.

Prof. **CHARLES F. CHANDLER**, Ph.D., LL.D., *Editor*.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

SEPTEMBER 14, 1889.

Vol. XX.—No. 17.

THE PICTURES AT THE BOSTON CONVENTION.

THE exhibit of photographs and other pictures at Boston was not as large as those shown at other conventions of the Photographers' Association of America; but in regard to the character of the work and the quality of the productions of the artists represented, they were a very decided advance. As on previous occasions, we cannot undertake to notice every exhibit, as our space is limited; we shall therefore confine our attention to the more important displays, and of these only the more prominent pictures can receive notice. In the matter of bromide prints there was a large display, but no very decided advances were noticeable. E. Decker, of Cleveland, made a fine display, and the work exhibited was fully up to any previous achievements in this line. In this line of work we noted some beautiful enlargements of microscopic objects made by W. H. Walmsley, of Philadelphia, which were both interesting and skillfully executed.

The Buffalo Argentic Paper Company also had an exhibit on their mat and glossy bromide paper, and showed some excellent work.

The platinum process was also represented in work by the Platinotype Company and Willis & Clements, of Philadelphia, who exhibited some beautiful landscapes in both black and sepia tones. This latter color seems admirably adapted for landscape work.

Upon the Anthony Bromide Paper we noted several fine exhibits. G. Hammer Croughton, who took a prize for pictures upon this paper, showed some beautiful work finished in crayon and also colored in pastel. There is no doubt that this artist stands in the first rank of workers in this particular phase of the art. On the same paper A. A. Knox, of New York, exhibited one of the finest collections of enlarged pictures we have ever seen. One large head was particularly fine; also a three-quarter figure, life size. The same artist also exhibited some specially finely finished enlargements worked in crayon, that were remarkable for the bold, strong, artistic character of the finish.

Another exhibitor upon the same paper was Froehlich, who showed excellent crayon worked heads of a high order of artistic work.

Coming now to the photographs properly speaking, we note first some beautiful yacht pictures and marine views by H. G. Peabody, of Boston. In these

we saw some of the best work yet exhibited by American photographers, the surf effects being particularly fine.

Folsom, of Boston, had an excellent exhibit of views, architectural subjects and machinery. In this latter branch of photography he deserves special credit for fine work with one of the most difficult subjects placed before the photographer.

J. Hall, of Brooklyn, N. Y., showed some very good views of the U. S. iron-clads and a number of excellent marine views.

Near this display of pictures we noted some very fine photo-gravure work made by the Boston Photo-gravure Company.

Cronin & Critcherson, of Boston, had an exhibit of solar prints finished in crayon and pastel. It was very finely executed and well worthy of close examination, being skillfully managed in every respect.

As usual, the well known Air Brush Company had a fine exhibit of pictures done with their apparatus, and the operation of the air brush in action was a source of interest to all present. It is certainly marvelous to see the ease and accuracy with which the work is accomplished and the beauty of the results obtained.

The above exhibits were in the main gallery of the Mechanics' Hall. Passing now into the art rooms, we note an exhibit by Walker, of Brantford, Ontario. In this we noted a generally fine character of work in all the pictures, and were particularly pleased with the groups shown. In this latter class of work we did not find anything superior in the whole exhibition; his groups were very artistic and always pleasant to the observer.

Byarlay, of St. Joseph, Mo., had an exhibit of the more ordinary every-day work that was very good, indeed—skillful photographic work in every respect.

Coover, of Iowa, had a number of very finely executed large heads, certainly among the best exhibited. His cabinet pictures were also excellent. We would only find one little fault here, and that is, we think that the smudged effect upon the background, in order to give relief to some of the heads in the medium sized pictures, was somewhat disagreeable to look at.

H. Randall, of Ann Arbor, had some of the best cabinet pictures in the exhibition. He also showed some fine work in large heads.

Hunter Brothers, of Taunton, Mass., had a fine display of cabinets of a high order; and the larger work was excellent in every respect.

Elmer Chickering, of Boston, had a large and very attractive exhibit. His life-size pictures in colors were uncommonly well done. In this exhibit we noted a particularly good life-size head of Mr. Robie, of Boston, and a capital composition group of Mr. Chickering and his artists in their reception room. The whole exhibit was remarkable for good posing.

Doerr, of Louisville, Ky., had a fine display of large male heads that were skillfully executed. We also noted here some fine effects in drapery, and a very fine series of cabinet pictures.

Baker, of Columbus, Ohio, showed twelve very handsome large frames of portraits and studies. In this exhibit we found the finest effects in drapery in the whole exhibition; the college girl in gown and college cap, and another picture of a female model, had draperies that were marvelously well done.

Holland, of Boston, had an exhibit that was notable for the gems of small work in it. Some groups of heads, and also single heads, reminded one of those

beautiful miniatures in vogue with our grandparents. We are sorry that he selected orange colored background for his display; it certainly was tiresome to the observer of the pictures.

Partridge, of Boston, showed a number of excellent cabinets full of good modeling and finely executed in a photographic sense. We should prefer a tone that was not quite so heavy; but this is largely a matter of taste.

Rinehart, of Denver, Colo., had a very good display of children's pictures. In the majority of cases these were very well done, and the little ones were caught in very child-like and happy poses. Some of his groups were also excellent.

Maul, of Chicago, sent a fine display of large heads, that were decidedly artistic; much more so than the majority of such pictures. The cabinets in this exhibit were also very good.

Horner, of Boston, also showed some fine large work of the highest grade, and the cabinet pictures exhibited were very well done.

Hardy, of Boston, had a number of large studies that showed a fine artistic feeling. A lady with a garden wall as a background was particularly artistic and pleasing; we also noted several others that pleased us much.

Hanmer, of St. Louis, had a collection of large work that was very good indeed. A very artistic picture was a half-length figure of a lady with daisies and wild-flowers in the foreground. The modeling and pose of the figure were particularly graceful. Another excellent picture was a lady with ostrich feathers in her hat; the beauty of the effects in the feathers being particularly finely executed without sacrificing any of the general artistic effects. The cabinets of this collection were in keeping with the other good qualities of the entire exhibit.

Want of space compels us to defer our observations of the other exhibits until our next issue.

EDITORIAL NOTES.

As we went to press with the last issue of the BULLETIN, we had not learned the names of the other members of the committee to select a photographer to serve with Dr. A. H. Elliott as representatives of the Photographers' Association of America in the World's Fair of 1892. The full committee is as follows: A. H. Elliott, W. I. Lincoln Adams, J. F. Ryder, W. G. Entrekin, W. H. H. Clark, A. Bogardus, H. McMichael, J. M. Appleton, C. T. Stuart.

EIKONOGEN, the new developing agent, is becoming more and more important every day. It has all the rapidity and snap of pyrogallol, with many of the good qualities of hydroquinone. Judging from our own results, and if the price is kept at a reasonable figure, it is destined to supplant all other organic developing agents. To those of our readers who are interested, we may mention that, chemically, it is said to be amido- β -naphtol- β -monosulphonate of sodium, and may be written symbolically: $C_{10}H_5(NH_2, OH, SO_3, Na)$.

THE English Photographic Jubilee Convention held in London have decided to hold their next meeting at Chester next year. Quite a number of interesting papers were read, and we hope to reproduce some of them in the pages of the BULLETIN. The address of President Pringle was an admirable review of the progress of photography during the last fifty years.

M. LEON VIDAL, in commenting on the Paris Exposition, says: "I have found very few interesting facts to be gleaned. There are a good many beautiful results of scientific and industrial applications of great interest, but what is lacking is invention—things which are original." This statement from a Frenchman of M. Leon Vidal's standing in photography is important, and would indicate that photographically the Exposition is poor. We hope the Congress will do some good work.

APROPOS of the Photographic Congress in Paris, we understand that they are about to recommend the adoption of a lamp burning amyl acetate as a standard light for testing dry plates and other sensitive surfaces. As soon as reports are to hand we will give the details.

IN the prize contests of the Photographic Society of Putnam, Conn., the following rules are observed, and as we think they may be useful to others we reproduce them:

1. Each contestant before joining the party must pay to the Treasurer the sum of two dollars. A committee of the unsuccessful contestants shall use this money to procure a suitable badge, which shall remain in the possession of the contestant obtaining the highest rating until the successful contestant of the next field day shall be named.

2. Each contestant must be prepared to make six exposures, all out-of-doors. No limit as to size, speed or make of plate.

3. Each must develop his own plates and prepare them for printing.

4. The resulting negatives, with two prints from each, must be delivered within ten days from the date of exposure. The package of negatives and prints must be marked with a letter which will be assigned to each competitor in such a way that he alone will know his mark.

5. The results of each exposure will be figured by points, as follows:

Focus.....	o to 5
Time of Exposure.....	o to 5
Development	o to 5
Condition of Negative.....	o to 5
(To obtain highest rating it must be free from fog or stain, "quick printing," neither spotted nor retouched.)	
Print from the Negative.....	o to 5
Artistic Qualities.....	o to 10

Total.....	35
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(It is possible for the poorest negative to obtain highest artistic rank.)

6. The negatives and prints shall be judged by some competent person who is unacquainted with any of the contestants.

THE American Association for the Advancement of Science has elected the following officers for the ensuing year: *President*, George L. Goodall, Cambridge, Mass.; *Vice-Presidents*, S. C. Chandler, Cambridge, Mass., Mathematics and Astronomy; Cleveland Abbe, of Washington, Physics; R. B. Warder, Washington, Chemistry; James E. Denton, Hoboken, N. J., Mathematical Science and Engineering; John S. Brauner, Little Rock, Ark., Geology and Geography; C. S. Minot, Boston, Biology; Frank Baker, Washington, Anthropology; J. R. Dodge, Washington, Economic Science and Statistics; *Permanent Secretary*, F. W. Putnam, Cambridge, Mass.; *General Secretary*, H. C.

Bolton, New York ; *Secretary of Council*, James Landon, Toronto ; *Treasurer*, William Tilly, Mauch Chunk, Penn.

The Association will meet next year at Indianapolis, on the third Wednesday in August.

WE note the organization of the Schuylkill Camera Club, of Pottsville, Pa., on September 3d. A regular meeting was held on September 6th, at the residence of Mr. E. F. C. Davis, Greenwood Hill, Pottsville. The officers of the club are : *President*, George M. Bretz ; *Vice-President*, E. F. C. Davis ; *Treasurer*, B. F. Patterson ; *Secretary*, Jay G. Shumway.

A BACKWARD GLANCE AT THE CONVENTION PICTURES.

BY G. O. LIGHTLY.

To one interested in photography and anxious to see it upon the highest plane commensurate with its resources, the exhibits at Boston must leave a pleasant recollection. The time was when photographers only strove for technical excellence—for the quality of negative and the brilliancy and tone of print. More recently the best men have striven to give art values to their productions. The portraitist is learning that the handling of the subject is more important than the handling of the plate. Further along the line we find those who are making detours into the realm of illustrative art. The Executive Committee of the Association recognized this trend in offering by far the larger number of gold medals for superiority in genre work. This naturally called out the best powers of the exhibitors. The special subject named—Evangeline—for the best illustration of which the grand prize of the bronze figures was to be awarded, rather overtaxed the resources of some of the competitors, but a number of thoughtful studies were shown. The first requirement of a picture that aims at illustration, is that the models selected should typify the personages for whom they stand. It may not be easy to find an ideal Evangeline, but certainly the person chosen to represent her was hardly fortunate in a single instance. Even in the series which took the grand prize, the face of the heroine in her girlhood lacked the fine lines and tender spiritual sentiment which would have been most grateful to the beholder.

Granted that in the two succeeding pictures, representing the later periods of her life, the story told by her face and figure left nothing to be desired. One feels, indeed, a degree of wonder when looking at the second scene, at the mobility of a face that can take on such an expression of pathos mingled with reverent hope. The lines:

“And the soul of the maiden between the stars and the fire flies,
Wandered alone, and she cried, O Gabriel ! O my beloved !”

here receive a fitting and subtle interpretation. In the final view, again so wholly different, there is no falling off in expression or action—it realizes to the utmost her state of mournful desolation. It may be said that the artist made a bold stroke in attempting to portray the vital points of the story by the use of a single figure, but it must be also said that he succeeded. One or two minor faults may be noted ; the moon in the second scene seemed wholly superfluous, and its rays could never have lighted the figure as it was lighted ; and, as before

said, the face of the model hardly realized in the first scene the sentiment conveyed by the lines :

“Homeward serenely she walked, with God’s benediction upon her.

When she had passed it seemed like the ceasing of exquisite music.”

It seemed fatal to the success of some exhibitors that three illustrations were required, instead of a single one. The early life of Evangeline, in her Arcadian home, it seemed to me, did not meet with a better portrayal than in the exhibit where she is represented at her spinning-wheel—a single figure—her head relieved against the light of an open window. The other scenes of this exhibit, unfortunately, did not bear out the promise of the first. The blacksmith shop in another Evangeline series was a picture most carefully and artistically managed. The blacksmith in this, however, failed to realize the figure of “Basil ;” and its close following, in composition, of an engraving published some years ago, must be considered an unfortunate coincidence. There were other Evangeline illustrations that certainly deserved “honorable mention ;” one picture comes up to me now—Evangeline and her father in the old Arcadian kitchen ; the light from the fire in the spacious fireplace lighting up the figures and the scene in a most realistic and artistic way.

Perhaps foremost amongst the genre exhibits, not illustrative of Evangeline, was a collection of six pictures from a Western studio, which were most charming in all respects, and of such uniform excellence that one has little desire to particularize. The scene representing an old crone unfolding a tale to the darky lad lying prone with his bare heels in the air, might perhaps be mentioned as a shade better than the rest. This was an exhibit where art values were not sacrificed to striking effects. The heavy beveled panels bearing these pictures and the old gold plush upon which they rested, the whole inclosed in an oxidized silver molding, made up a very chaste and unique effect.

Another exhibit in this class, where two picturesque models—an old man and an old woman—were represented against what appeared to be the wall of a house of the fishing hamlet order, was work of a high order of merit. The monotony of the same subjects and same background in four pictures out of six was perhaps the most serious objection that could be urged to this collection.

Jogging elbows with this exhibit was another from Burlington, Ia., which did not fall behind it in any respect, save that it was not awarded a medal. The six studies here were full of thought and rendered very finely. The old musical character and the laborer wending his way home at close of day, may perhaps be particularized as showing the power of this artist in illustrating scenes of every-day life.

It will be recollected that the prize taker in the Evangeline series was a medalist in the go-as-you-please class of genre work. The exhibit that secured him this honor was perhaps the most pronounced example of illustrative work in the entire exhibition. It might almost be said that it was a little too pronounced ; it escaped the grotesque by just a little. Still, the conception was remarkable for its dash and go, and the photography most skillfully done. The piece entitled “Shadows” was very striking and unique, but it might perhaps be urged that it was founded rather weakly in art principles. For example, the shadows upon the wall presupposed actual sunlight or strong direct rays of artificial illumination upon the figures and hands (which was not the case), to account for their sharp definition. A man of so much feeling and skill as this

exhibitor may possibly be allowed a little artistic license, even as the poets are allowed to cripple their mother tongue under the head of poetic license.

From a studio in western Virginia came a series of pictures illustrative of "Miles Standish's Courtship." Technically this work was good photography, but considered as illustrations it must be regarded as a parody. There was not the faintest hint in the garb of John Alden and Priscilla of the costume that belonged to the period, and the models themselves had nothing about them that conveyed the slightest suggestion of the Puritan youth and maiden. The exhibit in the Evangeline class by the same party had some well studied pictures of much merit, which makes the Miles Standish business all the more unaccountable.

In the department of portraiture pure and simple the work was mainly of an earnest and creditable character, and some exhibits, both in photographic and artistic merit, ranked high. Large heads, finely modeled and beautifully treated throughout, were shown in large numbers. Two exhibits from Louisville, Ky., one of which also contained some finely rendered half and full length female figures with white drapery, might be mentioned under this head. Especially did one of these exhibitors show us some cabinet work that I have never seen excelled. All things considered, it may be fairly said that Columbus, O., sent the most sterling collection of large, direct work in this class. Some picturesque old men in another exhibit were as fine examples of portraiture by photography as we may ask to find. Two full length female figures, of large panel size, in a small Boston exhibit were hardly surpassed by anything in the exhibition. Their excellence was acknowledged by a medal.

One of the foreign collections had a lesson for us that is well worth learning. This was a set of pictures on platinum paper (contact printing), embracing figures and heads treated most charmingly. The mat surface of this paper, as compared with the hard, glossy surface of albumen paper, and the wise restraint in retouching, which is so unusual in American work, gave a value that was readily admitted by the best men present.

These notes are intended only as a desultory glance at the collection, and by no means include all of even the most important exhibits. The direction in which the work seemed to be tending is most gratifying, and with the experience here gained and the improvement that will doubtless be made during the coming year, we may fairly look for still better displays at the convention next summer in Washington.

TESTING RELATIVE SENSITIVENESS OF PLATES.

To the Editors of the BULLETIN:

I always read the articles of Professor W. H. Pickering upon photography with interest, but when he recommends the pole-star as a subject for the camera, I am disposed to protest that there are much better subjects nearer by. Even though the object be to compare the sensitiveness of plates, I cannot conceive of any practical advantage in Professor Pickering's method over many others which can be much more readily carried out; indeed, I would be very much inclined to doubt the value of the numerical results obtained by successive exposures on stars of ten minutes each, as the atmospheric conditions are so liable to rapid changes, especially at night.

I suppose the practical question that the photographer generally desires to answer, is which of several brands of plates is the most sensitive; but as we have

no unit of comparison, a numerical statement of the relative sensitiveness cannot be of much practical value. We desire to know which plate will give the most detail with the shortest exposure, and this is a very simple matter to determine.

While I was in the East I read about the wonderful qualities of this plate and that for very rapid work, and various writers told wonderful tales of fine pictures they had made with incredibly short exposures—shorter indeed than most shutters in the market are capable of giving; but we will pass this by. Well, I was using some excellent plates made in San Francisco, which I thought were pretty quick plates, but I could never get results at all comparable to those of amateur contributors to current literature with equally short exposures. So, one day as I was ordering a new lot of plates from San Francisco, I wrote to a friend and asked him to send me one box of 8 x 10 plates, of either of two brands which at that time (1887) were reputed to be the most sensitive plates made. I told him to get the most sensitive plate he could find, as I wished to make a comparison. Well, I am not quite sure what plates I received, as my note-book is not at hand, so I will not mention the name; suffice it to say that I know they were one of the brands I wrote for.

To make a comparative test of the new plates and those from San Francisco, I cut a plate of each kind into two 5 x 8 plates, and again cut one of each of these into two 4 x 5 plates. Then putting a 4 x 5 of the new brand and a 4 x 5 of San Francisco into the same 5 x 8 holder, I exposed them both together on the foliage back of my house. Then turning the camera around I exposed the other pair upon the house. The plates were then developed in pairs in one dish together. I do not approve of the plan of comparing plates for speed by using the maker's formula for the developer for each plate. They should be tested with the same developer. My plates were put in and taken out of the developer together. I was not surprised to find that the San Francisco plates were decidedly the more sensitive, and I was forced to conclude that there are some stories written in books that are more wonderful than true.

As the negatives happen to be at hand just now, Mr. Editor, I have made you a set of proofs from which you may judge the results for yourself. In each case the better print is from the San Francisco plate.

This brings me to the matter of sensitometer numbers put on by the makers of plates. I would say that in general they are of no significance whatever, and purchasers had best make their own comparisons in the manner above described. When experience shows that a plate widely advertised as the most sensitive plate in the world, with a sensitometer number way up in the scale, is really less sensitive than other plates in common use, it is time to exercise caution and to make tests for ourselves before purchasing a stock of any brand of plates.

ROMYN HITCHCOCK.

[The prints sent by Professor Hitchcock are very interesting and show a marked difference, one set showing very much more detail than the others.—
EDS.]

"DIDN'T I order molasses?" she shouted to the grocer through the telephone yesterday. "Yes'm." "And you sent me vinegar!" "Yes'm, so I did. We are out of molasses, and won't have any until Thursday. Try and make the vinegar answer for a few days." And as he hung up the trumpet he growled to himself: "The people of Detroit are getting so particular that nothing will suit 'em!"

A PRACTICAL TALK TO PHOTOGRAPHERS.

BY M. E. AMES.

[Delivered at the Boston Convention of the P. A. of A.]

Now what I want to do is this—I want to give you a little hint, not how to make money, but how to keep money. There are a great many photographers who are very eager to make it. They are very careful to save every scrap of paper waste, and yet they throw seventy-five per cent. of all their waste away, thinking that the most of their waste, or the value of it, lies in the paper clippings only. When you silver a sheet of albumen, let me ask you what portion of that paper goes upon the card? The greater part of it. It is only a small portion of the trimmings around the outside that does not. And, to my astonishment, I have found photographer after photographer who did not stop to think that all the paper that went upon the cards, all the paper that was mounted upon the cards, contains silver. They wash it out, put it through a hypo solution and throw it all away. Others attempt to save it, and, for lack of knowledge, do not save it. Now I have said that each one chooses his own vocation in life for the purpose of making money. Now, if you set out in a certain direction in life to earn a livelihood, whatever that direction may be; if you are a photographer, be the best photographer that you possibly can. If you are an attorney at law, be the best pleader at the bar that you can possibly be, and do the very best for your client. If you are a farmer, study to be the most skillful farmer. And just so in everything, even down to the common laborer. Study to be the very best and to give the very best satisfaction. Now to be good photographers requires knowledge. There has been a great advance in photography since the art was discovered, since the first picture was taken upon a metallic plate fifty years ago. And I have thought that if there could be an exhibit of every photographer's work from the beginning of his business, back years ago, placed side by side and put in year after year among the exhibitions in the hall, we would have a chance to see what an advance has been made. Yet it has been stated here to-day by Mr. Bogardus that you are descending, going down hill. In some respects that is true, but as far as the work of photographers is concerned, they are making advances every year. And now in the years to come, if photography is to make a rapid progress, you ought to begin to educate those who enter into the study of the art, in the study of chemistry. How many of you photographers, if I were to call upon you to-night to hold up your hands, could say that you are chemists, even in the branch in which you are engaged? I know that to say that a man is a chemist, is to use a broad term, for chemistry is a broad study; it covers the whole creation of God. It reaches from the bowels of the earth to the most distant star. The growth of man is a chemical process. The growth of a tree is a chemical process. And when you will show me a man who is a perfect chemist and who has a knowledge of chemistry to its utmost bounds, I will show you a god. But every man may understand chemistry and be proficient in it in the branch in which he is engaged.

And now I want to talk a little of the chemistry of the metals which it is necessary for a photographer to understand, even in the saving of his waste. God has stored all the material that is necessary to enter into the photographic art, in the earth and in the sunbeams. And to be a good photographer, to understand the art, you want to know how to put a harness upon these agencies so that you may handle them to perfection.

There are others who, perhaps, want to say something here to-night, so I will enter at once upon the saving of waste, without any more preliminary remarks. You might think, perhaps, that it was unnecessary to say anything regarding paper waste. Almost anybody can save that. They can throw it aside in a box, or a bag, or any place they choose to save it. But yet it is necessary to give a few additional hints about saving paper waste. A great many get the idea that it doesn't make any difference as long as it has got to pass through a refining process; they think everything can go on with it, all the trash and all the dirt that is swept from the floor can go into the same box. That is a grand mistake. It is mixing up a great deal of foreign matter, and it increases the cost of refining, and thus lessens your returns. Therefore, keep the paper waste just as clean and just as free from all foreign matter, and from anything that has no silver in it, as you can possibly keep it. Others get the idea that blotters are very rich. Sometimes they are. I have had blotters that would yield an ounce of metallic silver to a pound. I have had those that were not worth ten cents a pound. And I receive more blotters to-day that are not worth fifteen cents a pound than I do that are worth more than that. Photographers ask why a blotter cannot contain more silver than albumen paper. Now, many times, if you take it according to the surface, the same surface upon the blotter as upon the albumen, you will find more silver in the blotter than in the albumen. But when you put them in the scales, and put in enough albumen paper to balance your blotters, you have got nowhere near the per cent. of silver in the blotters, by the pound, that you have in the albumen. We will take the habits of two different photographers. We will say that I am called, for instance, to illustrate two different galleries. The two photographers have the same general habits, except that one believes this, and the other does not. The one has ten pounds of albumen scraps. The other has exactly ten pounds, both silver of the same strength. One has five pounds of blotters. Now in that fifteen pounds of waste, five of blotters and ten of scraps, he has no more silver than the other photographer who had ten pounds of scraps alone. And yet he would be astonished if he found that his neighbor got just as large returns as he. It has taken fifteen pounds to distribute the same amount of silver that the other man had distributed through his ten pounds. This is enough, perhaps, upon paper waste.

Take the washings. Some throw them entirely away. They will attempt to save them, but not succeed. They will save the first washings and the second, and some of them will save the third. When they come to putting in the reagent, salt is a proper thing to use under some circumstances, but I do not consider it proper in print washings. Salt is a reagent. It is a proper agent to throw down the old bath. Print washings are so exceedingly weak that it is almost like taking a grain and putting it in an ocean of water. When you get it so exceedingly weak as it will be in print washings, where water after water is added, and the chloride is not sufficient to settle it, it stands milky for a long time. I advise putting the print washings and the hypo-fixing solution together. A great many get the idea that it is all in the print washings. They make a mistake; more lies in hypo than in the print washings. Now, if you understand chemistry properly you know that chloride of silver is not soluble in water, but is soluble in hypo-sulphite of soda, soluble in ammonia, and in cyanide of potassium. If you put them together, you increase the strength of the solution. Then use

sulphuret of potassium. Now, as to the amount to use ; if you should ask me how much to use, I should say, "Give me the exact amount of nitrate of silver that you have in the barrel, and I will tell you exactly how much of the reagent to use." You will say, of course, that you cannot do this. You have to get at it by experience. If you have a barrel full the better way is to precipitate it as it is added, day by day, adding a little of the reagent. Dissolve your sulphuret of potassium and keep it well corrected. For instance, supposing you have a pint bottle full of it, and you have a barrel half full of the solution ; pour in, for instance, a teacupful. Stir it up. It will all turn black. It forms the sulphide of silver. Then it clears up and the photographer thinks his silver is all down. To illustrate this, suppose we take two ounces of nitrate of silver and dissolve it in water. Now, we will use salt. We will put in just enough to precipitate one ounce, and we shall have changed one ounce of the nitrate of silver solution into chloride of silver. The rest remains perfectly clear. Many photographers will decant that and throw the other away. The right way is, when it clears up, to drop in a drop or two of the reagent, and so work on carefully. In the use of salt, be careful not to use an excess, as the chloride of silver is to some extent soluble in an excess of the reagent.

Regarding developer waste, it is not necessary to say much about that. There are hardly any galleries at the present time where there is any developer waste to speak of. There is no developing in the dry plate ; the dry plate developer is not worth anything. There is no silver that goes to waste in developing the dry plate. But in case any one should have any developer, I will say that I know one refiner in one of the Western cities who says in one of his advertising circulars that after you have precipitated your solution of hypo and washings, mixed as I have been telling you, if it does not clear up exactly, put in a solution of sulphate of iron. That man does not understand chemistry or he is trying to mislead. Sulphide of iron is formed which will look just like sulphide of silver to one who is not accustomed to it, so that he would not be able to tell the difference between the two. Therefore, you have a large per cent. of sulphide of iron mixed with the sulphide of silver. In this case if you have iron in your hypo, and you precipitate with sulphuret of potassium, just as long as that iron is in there you will be forming a precipitate again. So you do not want to add any iron where you use sulphuret of potash. In regard to the clearing up of solutions many complain because their hypo, when they use sulphuret, has color upon it. That color may be due to a great many causes. The barrel may have been used before. It may have been used for saving silver, so that the staves have taken something that gives color to the solution, and it will continue to do so as long as you use the barrel. But there is this to say about that color ; when you have precipitated your silver with sulphuret of potash and it clears up but still has color, you want to dip out a little into a clear glass or bottle or anything that you can look through. Now into this drop one, two, three or four drops, and then watch for the effect. Now, if it barely makes a color, and there is no precipitate, no substance gathered, nothing that settles down to the bottom, no sediment that goes to the bottom, then no matter about the color, pay no attention to it. But if you have silver there it will go settling down in small particles of the sulphide of silver. So test your solutions by dropping in a drop or two of the sulphuret that you use, and in a little while you will be able to tell, by your own experience, how

much you want to use to precipitate the barrel. Now, sometimes, in adding sulphuret, instead of turning black it will turn white. That is due to different causes. If there is acid present in your hypo which is not neutralized by your hypo, the sulphuret neutralizes it, and that liberates the sulphur from the sulphuret. In which case you would have some of that white milky streak and still get a precipitation. But if you get a precipitation and then continue to add the reagent, as soon as you begin to have that white milky appearance, that shows that you are now getting an excess of the reagent, and that is due to the liberation of sulphur. A great many object to the use of sulphuret of potash. It is the most powerful reagent used, and if you will use it right in the hands of experienced men there will be no difficulty. Let some one man take care of it. Do not let it be the duty of Mr. A, B and C to attend to it. See that it is attended to properly and there will be no trouble. It should be one man's business, and it should be a man who has studied the business, just as much as the man who does your posing has studied that, just as much as the man who does your manipulating has studied that. The saving of waste in a gallery is a science, and you want to begin to train even yourself or some of your help in that science. Let them have sufficient knowledge of chemistry to know the result of this and that. Now, the old barrels, many times after they have been used for a long time and have been standing full of this silver waste without being precipitated, sometimes contain a great deal of silver. I have obtained as high as \$25 or \$30 from barrel staves. And I have had them not worth a cent. It is better to keep the toning solutions separate and precipitate them with the sulphate of iron. Always acidify them. It is well to use sulphuric acid, just enough to acidify it, and that is all, and then your gold will go down. Test it in the same way as silver with sulphuret of potash. If it clears up drop in a little, and if there is no dark color your gold is all down.

With regard to emulsion, I do not know whether it is of any use to talk to photographers regarding that. They do not have enough to make it any object to bother with it. And as far as the dry plate manufacturers are concerned, they have very thorough knowledge of it now. I am refining it for all of the leading dry plate men in the country, as Mr. Cramer can testify. But I might say regarding the bromide of silver, to destroy your gelatine, if you want to precipitate it into a bromide, either use concentrated potash, concentrated lye in sufficient quantity, and boil the solution until it is thoroughly cooked, when, in due time, it will all settle and become perfectly limpid, and as clear as water; or you can precipitate it by heating and using sulphuric acid or hydrochloric acid in sufficient amount to destroy the gelatine, and the bromide of silver will settle.

Now, regarding the nitrate of silver, I want to give you something that you will remember and carry with you. I want to give you some tests for the purity of nitrate of silver. A great many photographers, if they get hold of a new brand of silver and get in any bad luck, are sure to locate it upon the silver. I want to show you how far imagination will go. A photographer in Coopers-town, N. Y., had occasion to go to a drug store to get some nitrate of silver. He purchased four ounces; it was my own manufacture of silver. It had gone into the drug store there from a wholesale drug store in New York. He knew nothing of the make of the silver and objected to it some, but the clerk assured him it was all right, as he was very familiar with the silver. The photographer

took the silver, tried it, brought it back and said he could not use it. He said: "Give me Powers & Weightman's." The clerk took down another bottle of my own manufacture and gave it to him. The next time he met him he asked him for a report of it, and he said it was all right, that the silver was just what it ought to be. It was the same brand exactly, manufactured by the same man.

In the city of San Francisco I found the photographers prejudiced in this way. They will use no man's make of silver but Mr. Rosengarten's, of Philadelphia. He makes excellent silver, Powers & Weightman make good silver, and I could name some others. You can use the silver of any reliable manufacturer. You can use it all. But when something gets going wrong do not lay it to the silver.

Now I will warrant my silver to be chemically pure. I warrant it in this way, that you take the original crystal. When you get a new brand save back a little of the original crystal. Then, if you have bad luck do not go to falling upon the solution you have made, do not put that into the hands of a chemist who will report it wrong because there was something wrong in the water or the dish. But when you take the original crystal I will guarantee it chemically pure. After you have dissolved it I would not warrant it all. Powers & Weightman once told me that they had a saucy letter from a photographer who condemned their silver. They wrote back to him that their silver was all right; but he thought he knew better than they did. After a while they got a letter of apology from him, stating that he had been analyzing and had discovered that he had hypo in the water. Now I do not warrant my silver mixed with hypo or cyanide of potassium. Now silver comes in contact with a great many different things that would upset the whole thing. It may be in the dish. It may be in the water. It may be in the atmosphere. It may be in the atmospheric condition of your room. Your coal stove may leak gas which comes in contact with the silver. You know what an affinity silver has for sulphur. Take a piece of metallic silver, as bright as silver can be, and put it in your pocket and put matches in the same pocket, and it will become black. Put it in your pocket without matches, and in warm weather the sulphur of the body will turn it black. Silver will be turned black by the perspiration of the body. I used to manufacture sulphureted hydrogen, and if it got onto dishes that had not been washed from nitrate of silver it would be as black as your hat. Let a room be full of turpentine fumes and you will get, to a great extent, the same effect. You want to study so that you may know what these causes are, and never fall upon the silver. It is not one time in a hundred that you can locate it upon the silver. Sometimes there may be something upon the surface of the albumen paper. The condition of that may be such that it works badly.

Now for the test. I was going to give you a test for testing the purity of silver. Many times people mistrust that it is adulterated with nitrate of potash. And it is one of the greatest wonders that, with the present prices of silver, it is not largely adulterated with some foreign nitrates; when silver has to be manufactured for less than a cent an ounce above the cost of manufacture. But if there should be any of these foreign nitrates in the silver, such as nitrate of potash, of soda, or of ammonia, the test for that would be what I will give you, one which any photographer could very well go through with without any trouble. Take just a few grains of the silver, very fine, break them up fine and make a little pile upon filter paper half an inch long or so. Roll that piece of filter

paper over it, and begin to twist it. Twist it all up as hard as you can without breaking the paper, and then touch a match to the end of that piece of paper, and the burning of that piece of paper will metallize that silver. It decomposes it and throws off the nitrogen, and you have a pure wire of metallic silver. Blow the ashes from the paper all off from that piece of silver, and put it in your mouth. If nitrate of potash is there you will detect it very quickly. If the silver is pure there will be nothing but the pure metal, and there will be no more effect than there would be in putting a clean ten-cent piece in your mouth. You may get a caustic, burning taste, which will be due to the nitrate of silver. But if it is thoroughly changed you will have no disagreeable taste. But if there is nitrate of potash there, you will observe it very quickly. This does not burn up. It is fusible, so it would be upon the surface of the silver; and you will detect it by the taste.

THE ART SIDE OF PHOTOGRAPHY.

BY G. HANMER CROUGHTON.

[Read at the Boston Convention of the P. A. of A.]

THE time was when it was considered a mark of good breeding to listen to a twice-told tale with all the interest and courtesy due to a first telling. This age has been aptly described as smart and slangy, and if one is unfortunate enough to commence the relation of a story to another who has heard it before, he is brought up very short by the single word *chestnuts* or *rats*. This may be smart; it certainly is slangy; but I doubt if it is wise, I know it is not courteous.

It is not wise, because the fear of ridicule would prevent many subjects being introduced into conversation which might be interesting or instructive. It is not courteous, because, although not new to you, it might be new to others.

So it is with something of this fear upon me that I open the subject of this paper for discussion. To many of the veterans of the profession it may be chestnuts, but there are others here that a few hints upon the art side of photography may benefit, and to them I offer them; asking the indulgence of the veterans who know all about it, for the sake of the younger members who do not.

What is art, and what are the rules that govern the production of pictures by photography? Practically speaking, there are no hard and fast rules in art. There are, more properly speaking, principles which are more or less elastic, but those rules or principles have been formulated by generations of men who have passed their lives in the study of nature and its representation upon canvas! and these same rules, or principles, must be observed if your photograph is to deserve the name of picture.

The attempt to make pictures by photography dates back to the very early days. Reiglander and Robinson, Hubbard and Ristin, in England, having produced them twenty years ago under disadvantages of which the younger generation know nothing, as you will probably appreciate when I tell you that in one of Hubbard's compositions (*Stolen Moments*) he told me he made twenty-one exposures upon one model before he got one negative to satisfy him, the exposure being five minutes to get the effect he wanted. The light had to fall upon the picture in such a manner that the shadow cast upon the wall behind

Bind this Picture
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opp page 526



VIEW OF GARDEN WALL
N. W. S. ALBERTA

VIEW OF GARDEN WALL
N. W. S. ALBERTA

YELLOWSTONE NATIONAL PARK

her became a principal feature in the composition. Therefore the light had to be cut off except through a very small aperture; hence the length of exposure.

No artist who is unacquainted with the difficulties which beset the photographer in the production of this plan of work can rightly judge of the results of his labor. Photography is certainly not a plastic art. The photographer must arrange his composition under his skylight, complete it in all its parts; he must enthrall his model with the sense of the part he or she has to play. He must pay attention at one and the same time to the linear composition, the composition of light and shade, and the pose and expression of his model. All this he must see in perfect before he uncaps his lens; and when the result is before him he has not the power of making corrections in part, he must reproduce the whole again with the defective part corrected, perhaps to find some other small defect overlooked in another part of the picture, and so to have the work to do all over again.

Of the linear composition there appears, from the glance I have had around the walls of our art exhibit, very little to say. There are some instances of too rigid adherence to the principle or rule of making the lines balance each other, the lines of the composition being arranged so nearly alike on each side as to be simply a repetition. This is to be avoided. The rule is a good one to have balancing lines on each side, but they should be so arranged that they should not be conspicuous reproductions on the right of the lines on the left of a composition.

Concentration or focus is the one quality which is defective in most photographers' productions. When I say focus I do not mean optical focus but artistic focus, which means the arrangement of the light and shade in a picture in such a manner that the eyes are compelled to look first at that part which is the center of interest.

In a portrait this of course should be the face, and in a subject picture it should be the figure or figures upon whom the story to be told centers. How then is this to be done?

If I take a blackboard and make a white spot in the center you will have focus or concentration in its crudest form. Also if you put a black spot on an expanse of white there is concentration; therefore if the face is surrounded by dark background and drapery there will be concentration or focus upon that face; but that is not all that is required; there must, to avoid crudeness, be present a quality called breadth, which comes into the lights of lesser intensity than the principal light, and, while it distributes the light throughout the picture, bringing out the details, is kept lower in tone the more they recede from the central or dominant lights. This quality, which, to an artist, is the most essential to a picture, is the one which is most disregarded by the average photographer; and many good photographs, judged from a chemical and manipulative standpoint, are completely spoiled by the absence of this artistic quality. How often you see in a portrait, for instance, a white cup or some ornament on a table, contending in intensity of light with the face, and so giving a spotty effect to the composition. With a very few exceptions, the compositions of the pictures exhibited this year are defective in this particular; in some there are as many as four spots of light of equal intensity, all calling for attention at one time, thus destroying both concentration and breadth.

There are several examples to be seen of a style of picture which requires great skill and judgment both in lighting and chemical manipulation. I allude to pictures where the face is in shadow against a lighted background. When managed properly they are among the most artistic effects which can be produced by photography. But it requires great care to keep the harmony of the composition there. One, which, as it is in the exhibit of one of the dry plate firms, it will not do the exhibitors any harm if I describe it and point out where an otherwise good picture is spoiled artistically by neglect or want of knowledge. The face and figure is posed against an almost white background. The upper part of figure and face are splendid, but the lower part of the limbs cutting with a hard line against the background causes the eye to fall on that point and follow down to the base of the picture, thus making the head of secondary importance.

This reminds me of an anecdote of the great critic, Ruskin. He was asked by one of our eminent R. A.'s to criticise a portrait. The painter was one of the Pre-Raphaelite school, and Ruskin, adjusting his glasses, commenced with the hunting boots and went upward somewhat in this fashion : " Yes, the boots are well painted, very well painted. The tops are quite good and the texture of the cord breeches is perfectly rendered. That velvet coat, too, the material could not be mistaken." Then, after a slight pause of astonishment, as if it was the last thing he expected to see, he said : " Why, bless my soul ! there is a head too !" That artist said after that he had learned a lesson he never forgot.

Now if, in the picture I was describing, the background had been graduated so that while the upper part was lighted, the lower part was shaded enough to prevent the hard cutting line, the head would have attracted the attention of the spectator first, and the concentration have been in the right place; for remember this, that wherever a dark line cuts against a light there will good concentration or focus be, and if you will study the works of great artists you will always find that the highest light and the deepest shadow are near together, and there is focus or concentration.

Another quality deficient in those photographs which I find most praised by professional photographers for their brilliancy in texture, either by the method of lighting or by over-retouching the real texture of the flesh is not seen, and a face, instead of appearing as if it would yield to the touch of the finger, has a stony shine which is like something metallic rather than flesh.

Now, in my opinion, there is nothing so beautiful as the texture of a properly exposed, well developed negative, and I consider that in such a one only the defects caused by the colors in the flesh tints, which photography does not render properly, should be removed by the pencil of the retoucher, and that in such a manner he preserves the original photographic texture; but when in his ignorance and conceit he thinks he can work all over a face, and make a texture which is an improvement upon nature, a sort of Madam Rachel complexion in all alike, men, women and children, I consider he has mistaken his vocation. If I had any influence, I would try and get the Committee of this Association to give a prize to the retoucher who could do the best work upon a negative with a pencil, and yet do all that was wanted and preserve the texture. I think one of the things which makes the exhibit of Mr. Mueller so admired is just this point, while all photographic defects are removed there is an exquisite texture throughout the whole exhibit.

I could have said much more on this subject, but there are other things which will be brought before you this evening, so I will conclude by saying I hope you will not think I have been hypercritical; while there is much to criticise there is much more to praise, but as we learn most by our failures, I thought these few hints might be of use to you.

THE EXHIBIT OF APPARATUS AT BOSTON.

THE display of photographic apparatus at the Boston Convention was the largest and best collection of the kind we have ever seen. Every manufacturer and dry plate maker did his best to make the whole affair a grand success. Such was the profusion and magnitude of the display that it would take several numbers of the BULLETIN to do justice to the many ingenious and wonderful things seen in the large hall of the Mechanics' Institute at Boston.

By far the largest and most varied display was made by the publishers of the BULLETIN, Messrs. E. & H. T. Anthony & Co., and we cannot do more than briefly mention the more important things exhibited in what has been well called a "monster exhibit."

Beginning with lenses, in addition to those of the world-renowned Dallmeyer, we noted a large series of aristoscope lenses and the work done with them. This latter lens is certainly very remarkable in the results it gives, when the price is considered, which is quite moderate. Another novelty shown was the series of cameras called "Front Focus Novelettes," which are made to focus by racking out the lens board inside of the rear part of the camera. These created considerable interest, and their many good points were much admired. The "Normandie" camera, a reversible back instrument of new design, was also exhibited, and as a first-class instrument is certainly one of the best now made; it is finely made and finished in handsome style.

In the line of cheaper instruments for amateurs the new "Victor" cameras were exhibited, and, considering their very moderate price, are the best now manufactured. They are strong, well made and thoroughly serviceable in every respect. One very popular little camera was also seen in this exhibit; it is called the "Lilliput," and is made to carry either plates, or the new culluloid films, only two and a half inches square. The little leather-covered box carries lens, shutter and six double plate holders. It is certainly a gem in photographic apparatus. The great advantages of this little instrument are, the ability to use either glass plates or films, and the fact that the lens does not require focusing, having a universal or fixed focus. With this camera we also noted metal kits to hold the celluloid films, also negative racks and printing frames to suit.

With other pieces of apparatus we saw adjustable negative racks, a new design of rubber trays called "Economy," papier maché trays, Farnham print cutters, and easels for holding bromide paper for enlargements. All this apparatus, and much more, was exhibited by our publishers, and they did not enter a single piece for competition for the bronze medal of the Association, having obtained a silver medal two years ago.

Among those things not strictly apparatus we noted, in the same exhibit, work done on the new Climax negative films, which has been pronounced "next to perfect." Also prints on the new Pizzighelli platinum paper, which is rapidly taking a high rank for artistic and permanent printing, owing to its ease of manipulation. There were also shown some beautiful pictures made on the Bradfish aristotype paper, and a number of fine enlargements on the Reliable bromide paper, all of which were greatly admired.

In the matter of chemicals, the display in the same exhibit was exceptionally fine. A whole series of negative and positive collodions were shown from the factories of our publishers, that exhibited the variety and beauty of the products better than words can express. In the same line were large, handsome bottles containing pyrogallol, hydroquinone and other more common chemicals, which

exhibited the purity of the products. Here, also, were found large quantities of compressed tablets of chemicals, such as pyrogallol, hydroquinone, potassium and sodium carbonates, sodium sulphite and potassium bromide, in pellets of an exact weight of a few grains, for the convenience of making up developers without weights and scales. For the amateur nothing can be more handy than these compressed pure chemicals.

We have given considerable space to this exhibit because it was sent with the idea of showing the magnitude and variety of the industry of the house of our publishers. It is probable that such an extensive display will not soon be collected again, owing to the enormous expense attached thereto, and those who failed to examine it at Boston missed a most interesting part of the exhibition.

The Blair Camera Company also had a large and interesting exhibit. They did not claim to have any very new things in their display, but aimed to show an advance in perfecting mechanical principles that they believed in and had tested. Their "double swing" on the Compact cameras adds no weight or bulk to the instrument, yet acts either as a double swing or as a means of strengthening the portion of the bed which extends in front, to enable wide angle lenses to be used without the bed coming into the picture.

They also exhibited a pedestal camera stand for the parlor, principally for use of the amateur. It embodied no new principles, simply making the appliances as beautiful as possible. Then they had a printing frame support, which enables the printer to keep his frame at several different angles, while it closes compactly when not in use.

The manufactures of these exhibitors were neatly displayed and the work was well and handsomely finished. The large space covered by the exhibit was well filled with many monuments of the ingenuity and skill of the workmen of the company.

Adjoining, was the exhibit of Smith & Pattison, of Chicago. The manufacturers made a very attractive exhibit of their leading specialties, including their Quadruplex and Duplex burnishers, also two new stationary tool burnishers, viz., the "Model" and "Ultimus"; but a new Duplex burnisher called the "IMPERIAL," having a hollow roll which was heated from the inside with gas or gasoline, constituted one of the chief attractions of their exhibit and of the Convention, and called forth favorable comments from all observers of its mechanism and the results it produced.

They also demonstrated the practical workings of "Baldwin's Paper Trimmer," which also constituted a center of attraction. Among other new specialties, we noticed Harter's paper trimmer, Collins' paper dryer and stretcher, Scott's print roller and Scott's studio album, Hetherington's backgrounds, foregrounds and border film negatives. They also showed some new posing chairs, papier maché accessories and other specialties.

The exhibit of Lafayette W. Seavey was an extremely interesting one. The display was in charge of Mr. Charles H. Davis, who is associated in business with the veteran Seavey, assisted by Julius W. Gries and Thomas Caldwell. A charming and handsomely attired Boston lady was present in the capacity of a model, and was posed by artist Davis with the various accessories and backgrounds. As a picturesque addition to the exhibit, the model was a decided success, and we have no doubt many of the photographers present learned much in the line of graceful and artistic posing.

The principal new things displayed were the plastic accessories which Seavey informs us have made a great hit in the photographic world, the demand being almost beyond their capacity to manufacture.

On Thursday and Friday the Seavey coterie procured the services of an orchestra of three pieces, and gave a free concert, which attracted a large crowd to their exhibit, and also enlivened the proceedings of the entire Convention. For this gratuitous entertainment we extend our own thanks and also the thanks of many others, as the music was of a high order and did much towards soothing the feelings of those who failed to become medal winners.

The more prominent dry plate makers all had handsome exhibits of photographs made upon their plates, and these alone formed one of the most attractive features of the exhibition. The most tasteful exhibit of this class was made by G. Cramer, of St. Louis. In this display were pictures made by Guerin, Stein, Landy, Jackson, Curtiss, Decker, McMichael, Scott, Endean, Röscher, Rose, Kuebler, Marceau & Bellsmith, Montford & Hill, Arthur & Philbric, Hall, Hanmer, Hardy & Roberts, Chickering, Gilbert & Bacon. These names tell of the popularity of this well known dry plate. It would be impossible for us to speak of the pictures in detail, but one word will express our thoughts—they were “superb.”

An interesting part of this exhibit was some work done on orthochromatic plates by Boissonnas, of Geneva, Switzerland, which showed the great value of these plates in copying colored pictures, and also for landscapes.

The exhibit of John Carbutt, the first manufacturer of gelatine dry plates in America, consisted of the newest developments in photography. Photographs from negatives on his flexible negative films, taken in Florida and Mexico; positives on his new positive films of landscapes and portraits; three pictures of a wonderful aerial delusion, by Professor Keller, photographed on Eclipse plates, by Rothengatter & Dillon, by the aid of magnesium light; photographs of the ruins of Johnstown, by the same artists, on Eclipse plates; landscape views on 18 x 22 special plates, and a remarkably fine photograph, 22 x 36 inches, of the Natural Bridge, Virginia, by C. H. James, Philadelphia; portraits by F. Gutekunst on Eclipse plates, including Edwin Booth, Captain Hamilton Murrell and many eminent Philadelphians. The value of orthochromatic plates is forcibly illustrated in the reproductions from oil paintings by Charles Tabor & Co., New Bedford, Mass., reproducing the various color values in a manner impossible to achieve with the ordinary dry plate. Among the specialties exhibited was Carbutt's New Enamel “Roxylene,” for varnishing the positive films, negatives and transparencies; also his well known *Multum in Parvo* lantern, which has had such a large sale.

(To be continued.)

OUR ILLUSTRATION.

Few amateur or professional photographers have a better collection of views of the Yellowstone Park than Professor D. L. Elmendorf, of New York. We have been fortunate enough to secure the loan of his valuable negatives in order to illustrate this issue of the BULLETIN. The pictures we present give an idea of the grandeur and beauty of this wild and interesting region of the Western States. Should Professor Elmendorf give an exhibition of the slides made from these negatives, we can promise a treat to all who have the opportunity of seeing them.

A NOTE FROM MR. ALLEN, OF DETROIT.

To the Editors of the BULLETIN :

Will you please inform me how the words, “Mr. ALLEN—It is 7 miles,” on page 511 of the BULLETIN of August 24th, came to appear? If they refer to me they were incorrect, as I took no part in the proceedings. Was it some other Mr. Allen?

Respectfully,

O. C. ALLEN.

The words are printed as they appear in the stenographer's report. We understand that another Mr. Allen was present at the meeting, and this is probably the person that spoke.—EDITORS.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

ST. LOUIS CAMERA CLUB.

THE meeting of the St. Louis Camera Club to receive the report of the Committee on Permanent Location was called to order August 2d, at 8.20 P.M., by *President BAIN*, with twenty-three members present.

Mr. HOLMAN, of the committee, being asked to state the object for which the meeting was called, said, that after canvassing the entire ground, the most suitable location for the Club offered was the school-house on 23d and Locust streets. The place comprises a hall 50 feet long by 28 feet wide, two large reception rooms and a well lighted basement suitable for dark room, dressing rooms, etc. The property comprises 300 feet on Locust street by about 155 feet on 23d street, and a proposition has been received from a lawn tennis club to take a portion of the grounds for their own use, thus relieving us of that much of the rent. It is proposed by the committee that the Club fit up the balance for lawn tennis and that the basement be arranged for a series of bowling alleys, etc., for the use of the members.

After some discussion on the part of the

members, a motion to accept the proposition was put and carried, and the Executive Committee was authorized to take a lease of the premises and to contract for the furnishings and fittings at as early a date as possible, that the Club may meet in its new quarters the coming winter.

On motion the dues were advanced to \$2 per month and the initiation fee to \$5.

On motion the meeting adjourned subject to a call from the President.

FRANK HICKMAN,

Assistant Secretary.

THE ANNUAL OUTING OF THE PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

NOTHING could be more perfect than the day turned out to be which was set for the field day and dinner of this Section. Several cameras were on the ground (or rather sands) at Coney Island, and many excellent surf pictures and groups were secured by Mr. H. J. Newton, Mr. O. G. Mason, Mr. Gray and others. Mr. J. R. Husson was also active with his Anthony Detective Camera, and no doubt secured many good shots.

Among those present we noted the following ladies and gentlemen: H. J. Newton, J. B. Gardiner, O. G. Mason and Mrs. Mason, Captain C. A. Wilcox, T. C. Roche, Dr. A. H. Elliott, E. B. Barker, Dr. John H. Janeway, the veteran Mr. Beckers, J. R. Husson, Harry Newton, Dr. R. Garden and Mrs. Garden, W. I. Adams and three ladies, F. C. Beach, E. C. Townsend, and Messrs. Fryer, Tuttle, Nightowler, Stetson, Chittenden, W. H. Bartholomew, M. L. Allen, Miller, Grey, Reed, Solomons, E. Copleston and F. H. Flandermeyer.

The *President*, Mr. HENRY J. NEWTON, in his opening remarks, said that there were many causes for thankfulness, but the one that interested the present company was the weather. All ought to be extremely thankful for the weather, because it was so much more favorable than at the same time a year ago. All also ought to be thankful for the presence of a number of distinguished gentlemen, among others Dr. Janeway, of the United States Army, who has recently come from California, and one of the first amateurs of the country, and he had great pleasure in calling upon Dr. Janeway for a few remarks.

Dr. JANEWAY said he could not give anything very explicit or comprehensive, and his talk must necessarily be a rambling one. He

said that he remembered noting a sign in a wayside inn, where, upon a board at the back of the bar, was this legend: "We trust in God; you pay here," and he said he would try to pay the company if they would trust a great deal.

Speaking of California, he said that the Californians brag a great deal of their climate. Those who have lived in the East think this climate superior to it.

It is generally supposed that the light in California is adapted to photography, but, with the exception of the first few hours of the day, it is more deceptive than in the East.

The amateurs of the Pacific are pushing their Eastern neighbors very fast in the way of numbers and work. One fault is their exclusiveness in the line they draw between the amateur and the professional. To his mind the relation between the amateur and professional is a mutual one. Each can learn from the other, and together they can push on in this work for the benefit of art and science.

Speaking of the Chinese, he said: Some Chinese work in landscape is very fine, but in portraiture they try to bring out the background rather than the subject.

The Japanese also are pushing along. Landscapes and seascapes, printed on a certain paper manufactured in Japan, are certainly marvelous, the paper being specially free from grain. It looks more like an ambrotype on paper than anything he ever saw.

Mr. STETSON was next called upon. He said he was no photographer; but there were many things he would like to speak of. One was recreation. Recreation is the question of the present age. Also temperance. We can have a jolly good time without everybody getting intoxicated.

Again, there are a good many ways of giving thanks to God besides getting on our knees. One of the ways to thank God is to enjoy nature, the sunshine, flowers, etc. This can be carried a good ways. Ben Johnson asked Sir J. Reynolds if he would not paint any more on Sundays; Joshua said he would not. Another artist said that when a painter painted, it was his way of praising God, and after a few other remarks, he concluded: "We want to cultivate the habit of earnest endeavor. Always try to get a little further; to do a little better."

Dr. ELLIOTT being called, and speaking of the problems of photographic chemistry, said: The more I think, the more I read, the more I learn of photographic chemistry, the more

I am bewildered; and any one that is endeavoring in any sort of a way, no matter how modest, to keep track of the various questions that are coming up in which photography is demanding the strict attention of the chemist, will stand appalled at the difficulties of these problems. You can hardly realize in reading chemical journals, of which there are probably forty in the three modern languages, French, German and English, that there is not one of them that does not contain every month some particular piece of information that directly or indirectly bears upon photographic research.

If I attempted to enter into the problems of photographic chemistry, and only ramble around and skim over the surface, as it were, I could keep you here all night. I do not want to give you a lecture on photographic chemistry and tell you that the new developer, eikonogen, consists of the combination of two benzol rings with certain other bodies, or speak of the other organic developers—you do not want to know anything about those. But these things are coming into photography. These are things that an intelligent photographer has got to study if he is going to be anywhere in the future. I contend that the desideratum just now is scientific photography. The chemist is getting into it, and scientific men, as Eder, Vogel, Schumann, Boissonnas of Geneva, men of large brains, men with large education; and the coming photographers, or the young men coming into photography, have got to have a scientific education. That won't make one an artist, I grant you—that is born in a man. You cannot make artists out of the majority of mankind, but there are some things you can teach every man. Chapman, in his old book on drawing, made the remark that I had early driven into my mind, "Any man that can write can draw." A man that can write you can teach to delineate. You can teach him to get a picture of a goblet, and it will look like a goblet. Or a chair, and it will look like a chair. Any of the simple objects he sees around. If this is so, then every man must have some simple principles within him which are artistic, more or less. Therefore we can all cultivate in the young photographer those principles, and in cultivating those principles we can find out whether a man should or should not be a photographer. Lots of men go into our colleges and are educated in science, that go down-town afterward and sell corn and buy potatoes. This process of education is weeding men out. Young photographers should be put through

a course of education, and such a course of teaching as will develop in them that faculty that can see a picture when presented to them, and can fix that picture on their plates.

CHAIRMAN—That a person may be a photographer and not an artist is very true. We have a gentleman with us, Mr. E. C. Townsend, who is familiar with the artist part, not only in photography but everything else, and he can talk to us about art.

E. C. TOWNSEND—*Mr. Chairman, Ladies and Gentlemen:* You have probably heard of the play of "Hamlet"—with title role left out; well, I had hoped (selfishly perhaps) that the play for this occasion might be produced in the same way, or at least that your humble servant might have been cast for the omitted part, in which capacity I think I would have scored a brilliant success, and been a quiet spectator, silently enjoying the feast of reason and flow of soul, not forgetting the respect due the good things which mine host of the "Brighton Beach" has provided for the inner man.

I really felt myself abundantly able to do justice to such a part, and was prepared to assume it, because I knew the exertion would be much less than in talking or even thinking; but our worthy stage manager has willed otherwise, and I acquiesce, and as this acquiescence is entirely in the interest of harmony, I trust that a few remarks at this time upon the character and uses of harmony may not be considered amiss.

We read in Dryden's song to Saint Cecelia that

"From harmony, from heavenly harmony,
This universal frame began;
From harmony to harmony
Through all the compass of the notes it ran,
The diapason closing full in man."

In this there is but little doubt that Mr. Dryden intended a very liberal compliment to some one, and it has been suggested that he imagined himself entitled to it; but I opine that a somewhat prevalent sentiment is voiced in saying, I never thought so! And were he with us now I would not hesitate to question his assumption, and to differ with him on the broad ground of the apparent lack of harmony manifest throughout the realm of animate nature; yet, everywhere we find, seemingly, the germ of harmony striving with the incongruous—as it were an effort of the "soul of things" to assert itself.

When we look about us, carefully scanning the acts of our fellows and delving into our own inner consciences, we are led to think

of man, not as a harmonious being, but rather as a dissonance, an imperfect chord, with now and then only a touch of harmony; and not in man alone is this incongruity manifest, but in everything else; each and every aggregation owes its origin, its form and its existence to the touch of harmony inherent in its seeming incongruous parts.

It is claimed by some thinkers that there is nothing positive, nothing real—that everything is only relative, changeable and forever changing, not only in form but in quality also, and that for the better.

This proposition being tenable, may it not be that what we recognize (not to say comprehend) as harmony, is only the visible manifestation of a principle of nature, as yet but partially developed, and constantly and forever varying in degree, but always being in consonance with the character of each organic form, but presenting such a diversity of manifestation (and especially in the human) that they seem to verge upon a condition of discord?

In the account (such as we have) of creation, we are told (inferentially) that order was evolved from chaos—confusion, or, if you please, that harmony resulted from discord, and from falsehood truth, the mighty, which will prevail.

So, if we read nature aright and wisely heed her examples and demands, we will liken the harmony within us to the leaven which was hid in the three measures of meal; and by thus keeping it active, be enabled through its influence not only to modify all forms of discord in the lower orders, but to realize each for himself all that there may be of beauty and truth for the progressive development of both the material and the spiritual man.

And then may the photographer, whose art is true to the harmony of chemistry, produce, not only likenesses of the material form, but also truthful reflections of the essence as well, which, scanned by the eye of just criticism and weighed in the balance, shall encourage the hope in each, that the harmonious quality of his own monody may induce more perfect chords, until the diapason of perfect harmony is attained, and the symphony of human existence shall have its culmination in spirit, which endureth.

D. R. GARDEN, Secretary of the Farmers' Club of the American Institute, being called, replied as follows: My chief claim to a knowledge of agriculture may be found in my name. But to-day this company is especially

avored—for we have not only a Garden, but a Gardiner—not on the floor, but in the chair.

Some of you have seen the Cats-kill Mountains,
Others have seen a Garden walk,
But few of you ever heard
A city Garden talk.

In the language of the Prohibitionist, I will say a few sober words to you if I can.

Agriculture is a broad term, embracing very much of what makes this world prosperous, progressive, healthful and beautiful. While other arts and sciences are the outcome of advanced requirements or varied experience, the science of agriculture began "in the beginning," for Father Adam, Holy Writ says, was ordered to "till the ground."

Agriculture, then, is like Truth,

"Not for an age, but for all time."

No greater commendation could any science receive than that which the immortal Washington emphatically paid it, when he wrote: "Agriculture is the most healthful, the most useful and the most noble employment."

The successful agriculturist is a student of nature.

Your countenances picture your satisfaction with the luxuries of earth, some of which we have enjoyably partaken of this afternoon, for our "dry plates" are "positive," though silent, witnesses thereof.

Progress is a plant of slow growth. Nature is ever active. She loves variety, and brings defects and plenty, weeds and flowers, cereals and insects, fruits, vegetables and calamities.

The inspiring Longfellow encouraged all who belong to the Grand Army of the Industrious when he sung:

"Learn to labor and to wait."

'Tis often over the macadamized road of failure that success is reached.

What long years of experiment after experiment, of observation, of comparison, has it taken to produce out of the quiet, dark earth the fragrant and beautiful flowers and the numerous and nourishing edibles of these days, from their former coarse, pigmy and insipid condition!

If men in prominent positions go down to the sea for the sport of fishing, a nation of fishermen would be a dreary and weary contemplation.

Were this earth to become barren and void, whither should we go for sustenance? 'Twould be cruel to give such a thought root. We will not.

How mysterious and marvelous is the soil. "All flesh is grass." "Consider the lilies, how they grow." Universal vigilance is the

price of potatoes. As the seasons take their flight, and nature's reconstruction begins, brain follows the plow as reason enters the earth, and the warm, friendly sun kisses into activity the slumbering seeds—then indeed will the hill-sides, the valleys, the plains and the gardens teem with waving grain, luscious fruit, appetizing vegetables, and beautiful flowers will lend their sweetness to the evening air.

The Farmers' Club has exercised an influence which the earliest records of the American Institute, to its very latest, will attest. Nor can the history of agricultural progress in its various branches ever be written, and the transactions of the Farmers' Club omitted. Their meetings have been attended by gentlemen eminent in their various specialties, and the proceedings of the meetings spread broadcast over this vast country, through the medium of the weekly journals.

This Club, though the pioneer of scores of kindred associations, still exists, and though its meetings are not so well attended as formerly, the information given is quite interesting and instructive.

The science of agriculture has surely kept pace with the other sciences in their manifold improvements.

Pardon my digression to submit a suggestion. These United States have not yet selected a national floral emblem. In my humble opinion, I know of no more appropriate floral symbol for your adoption, ye art scientists, who depend so largely upon the orb of day for your achievements, than the sun-flower.

"Friendship is a sheltering tree," therefore no one lives for himself alone. The various trades, professions and arts, in addition to their profit, are pursued for their pleasure, each and all tending to the comfort, the enjoyment, the welfare of home, of kindred and of country.

How grateful we should be, living as we do, in these days, teeming with the blessings which flow from the labor of so many who have indelibly impressed their genius upon the records of time.

Each, according to his circumstances, may do something to increase the happiness of others. Then those who come after us will offer benedictions to those who have "gone before."

The CHAIRMAN, speaking of the absence of Colonel Wilcox, of the house of our publishers, said that he noted the presence of his brother in the room, and called for a few remarks.

Captain WILCOX thanked the President for mentioning his brother's name and also suggesting that he should say a few words. He said he had heard a story of a little girl who asked her mother if John L. Sullivan should die, would he go to heaven, and the mother said she thought not. "Will he go to the other place, then?" asked the little girl, and the mother replied that may be he would. The child said, "Then he will lick the Devil." This was about what he thought of photography, and that the Photographic Section was doing a large share of the work.

Mr. NIGHTOWLER being called, said he could show pictures better than he could talk about them. If any had negatives he would make lantern slides of them and then tell them what they were worth.

Mr. BECKER, in reply to the Chairman's request for one word, said: One word I say, I thank you.

F. C. BEACH said that it struck him the prevailing sentiment among amateurs is to take artistic photographs rather than technically perfect ones, and this had led to the publication of a book called "Naturalistic Photography," by Dr. Emerson, the idea being to make the surroundings subordinate to some central object; the general drift being to overlook technical excellence in favor of artistic merit. Artistic photography is rapidly developing.

Mr. O. G. MASON said that he had taken charge of the keys at headquarters, hoping that he should be called out and would have escaped this infliction. But there were one or two things which had not been mentioned, one of which he would like to speak of—"The ownership of what we work from." It is becoming a vital question. They have discussed it on the other side of the water; there have been two or three decisions by the courts on the other side, and I understand that there are many people here who are beginning to claim that the photographer should give the plate with the prints. We might as well ask Dr. Elliott or Mr. Beach to give the patrons of their papers the types from which they printed the paper as for the photographer to give up the plate from which he prints. When a photographer gives up his negatives, he places in the hands of his customer not only that which is valueless to him, but also gives him the opportunity to use that plate for inferior printing or to sell it to some other individual who may produce prints from it and work on a false reputation. He may stamp them with his name or any other name, and the maker

of the plate never gets credit for it. This is a matter to be considered—perhaps a little out of the regular order of dinner discussion, but it came to me as one point that had not been passed upon and one quite practical.

After a few remarks from Messrs. Husson, S. Iomons and Flandermeyer, Mr. J. B. Gardiner spoke as follows:

Ladies and Gentlemen,—I think I ought to be excused from taking up your time with anything I can say, as I have already expended all my eloquence in the effort to discharge my duty as Chairman of the Outing and Dinner Committee. I am sorry I could not have been more persuasive, and thus induced a larger number to unite with us. But I found those unanswerable excuses formulated more than eighteen hundred years ago still in vogue, and was, therefore, obliged to quietly listen to that classic story: "I have bought a piece of ground, and must needs go and see it; I pray thee have me excused. And another said, I have bought five yoke of oxen, and I go to prove them; I pray thee have me excused. And another said, I have married a wife; and, therefore, I cannot come." To such it can only be said, that an opportunity like this, once lost, is lost forever—no repentance can atone for such sins of omission!

It is gratifying, however, that although our number is not large, it is excellent in quality, for we have with us to-night some of the leading representatives of our art, not only as skillful practitioners, but as experts in its artistic, chemical and mechanical branches. We have, too, some of the chief representatives of its commercial and manufacturing interests, men whom we may justly call giants in the special field of their activities. It is to these representatives we are all glad to listen, and, therefore, I shall not attempt to respond to the toast assigned to me, viz., "The Object and Uses of our Photographic Section, with a Brief Summation of its History." If time permit, however, I will take up this theme on the evening of our first regular meeting in October.

As I have not the gift of Colton, the author of "Lacon," to say "many things in few words," I find myself quite incompetent to do justice to you, to the subject or to myself in the few moments I might be expected to occupy your time this evening. I trust, therefore, you will pardon me for thus postponing the "many things" I am anxious to say in reference to our Section. That this occasion has proved an agreeable one to all is the earnest wish of your committee, and it is

hoped, therefore, that you will "nothing extenuate or set down aught in malice."

Dr. ELLIOTT then proposed a hearty vote of thanks to Mr. J. B. Gardiner for his earnest and painstaking labors that had resulted in such an enjoyable outing. This being seconded by Mr. O. G. Mason, was carried unanimously. Thus ended one of the most delightful reunions of the Section.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

(Continued.)

Mr. RANGER—With due deference to the last speaker, I would say that those who live in Washington and are accustomed to the climate do not, perhaps, feel the effects of it as I do. I was there for six weeks a while ago. When I left the country here it was comfortable. There I was roasted. I suffered all the time I was there. I think you will find that is so with all people who live in the Northern States. Those who live in that vicinity cannot be expected to feel the heat so much. We must remember that if we are going to have the Convention there, we cannot go to Washington beforehand and see how it is going to affect us. Moreover, in the four days allowed us we cannot spend time in sight seeing without neglecting the business of the Convention. I think, too, that the experiments we have made before of going to extreme points, have not been a success. It is our desire to get the most good that is possible, and we should select the most accessible point for the greatest number to reach with the least expense.

Dr. ELLIOTT—In discussing the subject of going to any place, one of the first things to consider is, what accommodations can we get for our exhibition, our art exhibition and our stock dealers' exhibition? Now, I do not know Washington very well, but it seems to me, from what I remember, that there is no convenient building that we can get at any reasonable rate, where we can hold our meetings. In the second place, we have been to Buffalo. We know what Buffalo is. We had a real good meeting there, and we have had a taste of the good things around there. I believe that Buffalo is a good place.

With regard to the temperature, it is hot everywhere at the time we hold our meetings. Last year we went up into the Northwest, to Minneapolis. We got baked. (Laughter and

applause.) I was there and I know what it was. But I do not think the temperature has anything to do with it. If we can get proper accommodations, and if our people in Washington can do something for us—and you understand there must be some local assistance always—I say all right; let us go to Washington. But do not take into consideration the question of temperature. It is hot anywhere in the summer. July and August are hot months. (Applause.)

Mr. STANTON (of Toronto, President of the Canadian Association)—I am not, in any sense, a public speaker. I will tell you that before I make any remarks. I think it would be well for you to consider carefully what you are voting upon when you are voting for a locality for the next Convention. I, as a Canadian, know something of the Northern climates. I know something of the climate of Buffalo and Detroit. I was well pleased when Detroit had been selected, but I find people very much dissatisfied with it. I know something of Washington City. I was for fifteen years a resident of Maryland, residing in Baltimore. I know that Baltimore and Washington are very warm in the summer. I know that everybody who can get out of such cities in July and August does get out. I know you will find cool places in Maryland. Go out on the Baltimore and Ohio Railroad a little way, to high points, and you will have to sleep under a blanket at night. Somebody from Georgia told me he came by the way of Washington and found it cool. It might be to a Georgian living in the low lands of Georgia, but would not be to one living on the high lands. I find all low lands warm. And I find Washington very warm. It is a place of magnificent avenues; but on Pennsylvania avenue the rays of the sun come down with such intensity as to almost roast one. You go into a house and you can scarcely sleep if you have more than one sheet over you. The people there sleep on the door-steps. Then, too, it is in the extreme East. I think some more central place would be better. I would be in favor of Buffalo, since we found there the man who has been nominated as our next Secretary, the very active man whom we now have for President.

A Voice—How about Toronto?

Mr. STANTON—Toronto? Come to Toronto, and we would welcome you with open arms. And I think we can find a place where you can exhibit. If you will consider the invitation, I say again, come to Toronto and we will give you a right royal welcome. And

I know that we have sufficient hotel accommodation. I have nothing more to say.

Mr. RYDER—I would say with reference to Buffalo and with reference to the success of the next Convention, that the places which have been visited in the way of experiment have not panned out very well. Buffalo gave us a great success. We have had the advantage the last few years of having a man at Buffalo who has cared for the interests of this Association and who will make it a success. I am not trying to flatter the President, but when we go to Buffalo we feel sure of the result. If we go somewhere else, why, we will take what we can get. I am a Buffalo man for the next Convention. (Applause.)

Mr. BARRYMORE (of Virginia)—I have been a resident of Washington for several years, and I wish to bear out what our friend Pullman said about Washington. I also wish to say that the gentleman has overdrawn the picture of the warm weather at this time of year. It is not so much warmer there than it is here. According to a letter I have just received this morning, it is nearly as cool down there as it is here. We can certainly give you as good accommodations there as any place you can select. Then, again, you will have plenty ready and willing to help make the thing a success. There will be no trouble in that respect, I am sure. Therefore, I say, go there.

Mr. RANGER—There is one other consideration, and that is, dollars and cents. In some of our conventions we saved a little money above expenses. When we went to the extreme points and new places, experimentally, we had to spend all the money we took in and draw on some of the old funds. And if we continue that a little while, we shall not have anything left. It is good policy to keep what money we have; it is good business policy to save what we have and to get a little more with it. This experimental business has not proved a success.

Dr. ELLIOTT—I would like to call the attention of the Association to one thing. We went to Minneapolis last year. There were about four hundred members there. Each one paid two dollars, and the Association was four hundred dollars out. In other words, it took three dollars to take each man to Minneapolis. It cost the Association three dollars a member, for every man that went to Minneapolis.

Mr. HERB—With reference to one statement that Dr. Elliott made, to the effect that accommodations could hardly be had in

Washington, I would like to say that the Treasurer of this Association informed me that he had prospected Washington for a year or two, and that not only the hall accommodations, but the hotel accommodations, were very good indeed. Of course we must know they would be at a time when Congress is not in session. As for the claim that Washington would be oppressive to any man who goes there, I trust we would have money enough to buy a seersucker suit even at present prices. (Laughter and applause.) Buffalo is a good place. We have all been there and know that it is a fine place. But those who were there so recently as four years ago, when the Convention was held there, would perhaps prefer some other point. I do not think Washington can be regarded as an extreme point. Mr. Ranger is constantly telling us that it is. We are at an extreme point here and were at Minnesota. But Washington is far more central than either.

Mr. MOTES (of Atlanta, Ga.)—I simply wish to try to meet the remarks that Brother Ranger has made. I want to give him the distances with respect to Washington. It is 230 miles from New York. Six hundred and forty-eight miles further south I live, in Atlanta, Ga. And I think, considering that fact, Washington is as near the center of the country, north and south, as any place we can find. As far as climate is concerned, it is not necessary for me to say anything about it. Others have spoken upon that topic. But I do not speak for myself. I do not care anything about Washington particularly. I will go anywhere the Convention goes. If it was to be held in Alaska, I would go. (Applause.) But I speak in behalf of the Southern people—Southern photographers. I have been in correspondence with quite a number of them, urging them to take an interest in the Convention and to make an exhibit. They say, "If you will come South, if you will come to Washington or Baltimore or Cincinnati, we are prepared to go, but we cannot go North." So, I think, in consideration of that, gentlemen, as it is only for one year, we might go to Washington without any serious damage, and then we can go to Buffalo next time. Let us scatter the honors all over the country. Let us give all a chance. The Convention has got a little money, and it can afford to pay out a little in order to aid a few people who are not able to come further north. I hope the brothers will withdraw their objections and let us go to Washington this time. We will promise to vote unanimously, as far

as our Section is concerned, for Buffalo next year. (Applause.)

Mr. HASTINGS (of Boston)—Mr. President, the matter of accommodations for the stock dealers, from whom we probably get our largest revenue, is something that ought to be taken into consideration. Advocates of these different places ought to inform the Convention what accommodations can be secured for the best results.

As to the matter of temperature, I think the majority of us have been pretty well tempered under the skylight, so that we can stand it three or four days almost anywhere. (Laughter and applause.) I say, look out for the obtaining of grand, good accommodations for the stock dealers and all exhibitors. As far as hotel accommodations are concerned, we can generally find ample accommodation for three or four hundred men.

Mr. HOOVER—I think we are losing sight of the main thing, and that is, the good of the Convention, and the benefit to photographers at large. If we are going on a pleasure excursion, let us go to Washington. If we are going for business, let us go to Buffalo. It simply settles down on that. I do not care to speak about the heat in Washington, because I have had enough of it. I have been there several times. We know what Buffalo is. We know we can have the choice of four splendid buildings and locations. If we will pay our money, we can take our choice. We have exposition buildings, a Music Hall and two big arsenals. And I do not think you will find any better railroad accommodations anywhere. If you want to take a sail, you can take a sail, too. As far as pleasure is concerned, we can dish that up in various ways. And we certainly have proven our ability to make a financial success of the Convention, which, in my estimation, is the main thing. If you are going to have a pleasure excursion, let us take the money that we have in the treasury and go to Washington. If not, if you wish to go for business, let us go to Buffalo.

Mr. ROSCH—With regard to the hotel accommodations in Washington, they are ample in the summer, when the Senators and Representatives are all away. On Pennsylvania avenue there are several large hotels. There is no city that has more points of interest. There is a navy yard there, an art museum, a Smithsonian Institute, and many other places that can be visited if any one would be glad to go to them. Then, again, if we are going to have a different place for meeting every year, why not go to some place where we have

not been? If we are going to continue in one place, why not build a building and have the Association permanently located in one city? (Applause.) (Cries of "Question.")

A ballot having been called for, President McMichael appointed as tellers the 1st and 2d Vice-Presidents and Mr. Stanton.

A Member—Mr. President, our friend Bogardus has got a curiosity here, which, no doubt, most of the members will like to see. It is a daguerreotype of Daguerre, made in Paris in 1846, and if the members would like to see it, it can be passed around.

The President—Here is another daguerreotype for exhibition, "The Court-yard of the Convent of Sydia in Syria, taken in 1839 with one of Daguerre's original instruments by a friend of Daguerre's, who was traveling through Syria for his health."

Mr. CLARK—This picture was donated to this Association for this occasion, for the purpose of examination, and it has been requested that I read an extract from a letter in order that you may better appreciate looking at the picture. The picture which you will have the privilege of examining was taken in 1839, as stated by the President.

BOSTON, August 6, 1889.

To the Photographers' Convention:

GENTLEMEN,—I beg to tender you as a loan a daguerreotype taken with one of Daguerre's original instruments in the year 1839.

It was presented to me by Monsieur H. G. Joly de Lotbiniere, son of the gentleman (amateur) who took the impression.

Should you deem it worthy it is at your service. Appended please find the copy of a portion of Monsieur H. G. Joly de Lotbiniere's letter to me.

Very truly yours,

CHARLES W. GALLOUPE,
35 Devonshire street.

(Extract of a letter from Monsieur H. G. Joly de Lotbiniere to Charles W. Galloupe, dated October, 1888.)

"It represents the inner court of one of the numerous Convents where the travelers of those days were hospitably entertained by the good Fathers.

"The journal frequently alludes to the taking of daguerreotypes in Greece, on the Nile, in Palestine, Syria, etc., and describes in each case the result, which was much more often failure than success. The sun, the heat, want of experience in the proper use of the numerous chemicals used in those days, the impalpable grains of sand from the desert staining the

metal plates, the neglect and awkwardness of the Arabs who helped, the difficulties of moving about safely all the necessary paraphernalia, etc.

"My father undertook the Eastern trip for the benefit of his health and thought it would add much interest to his travels if he took one of Daguerre's apparatus. Of course he must have obtained some information as to the mode of using it; but whether Daguerre's theory was not yet perfected, or my father's practical knowledge insufficient, he had to contend with great difficulties, gradually improving by patient experiments, without ever appearing to have reached a perfect solution to his own satisfaction.

"The difference of climate, light and heat between France and the East must have had something to do with it.

"He had the good fortune to meet in Egypt the great painter, Horace Vernet, who on his side had also brought one of Daguerre's apparatus. They took several pictures together with variable success, improving as they went, but evidently still in the experimental stage.

"It is interesting to compare the rapidity and perfection with which photographs are now taken, with the slow and complicated process of the daguerreotypes of fifty years ago, requiring in some cases, as I see by the journal, as much as nine minutes to take one picture."

Mr. RANGER—I move a vote of thanks to the donor of the picture, C. W. Galloupe, of Boston.

Mr. CLARK—The picture is loaned for the purpose of exhibition.

A vote of thanks to Mr. Galloupe was then passed.

Mr. CRAMER—I move that the letter be placed on file and published with the records of our meeting.

(The motion carried.)

A vote of thanks was also tendered to Mr. Bogardus for the exhibition of the original picture of Daguerre.

Mr. RYDER—While these ballots are being counted, I would like to say that, this being the fiftieth year of the discovery of photography, and, in a manner, a proper time for a jubilee, and there being now assembled in the City of Paris a congress of the photographers of the world, I move you, sir, that a committee be appointed, and I will suggest that the present officers of this Association should be that committee, to receive one dollar subscriptions to a little monument or a tablet to Daguerre, (applause) to be put in some public

place where all can see it, and where we would be doing ourselves pleasure and honor in contributing to a memorial of the man who has done so much for us. (Motion seconded.)

I will suggest further that the journals devoted to our art could assist in this matter by publishing the contributions, giving the names and addresses of all contributors. And by the time of our next Convention perhaps there might be a fund which it would be worth while to devote to this object.

Mr. STANTON—In seconding that motion, I might, perhaps, make a few remarks. I am one who, since the year 1855, has been engaged in photography. I made, first, daguerreotypes. You probably can find but few men here who can say that; my friend Bogardus, and perhaps a dozen more, will be about all. I think we ought to have had here a large exhibition of daguerreotypes. My collection was unfortunately burned some years ago. But there are fine collections of daguerreotypes in New York, those made by Brady, Bogardus and other parties, which should have been here. We have a magnificent collection of photographs here. They are all daguerreotypes, for daguerreotypes are photographs. There is no question that they are all of one type. We should have exhibited photographs made by mechanical process, or photo-gravures. The photographs that are used in book publications should have been exhibited in all the perfection in which we find them to-day. Also, the men who are engaged in this work should be invited to contribute to this monument. By these means we will be able to raise a magnificent fund, for the erection of some kind of a monument to the founder of our great and wonderful art. I think, gentlemen, that we do not take a high enough stand in this art of photography. We are not united enough. We are satisfied to take too low a level. We are satisfied to take too little for our work. We ought to organize, and we ought to educate the people. We ought to become a class of people who are known and who have a standing in society like our physicians and dentists, and like many other men. We take a lower stand—there is no question about it. As a class of people we have no standing, as photographers, as compared with physicians. Take the physician of a few years ago, and he had no standing. It is only within a few years that Harvey settled the matter of the circulation of the blood. It is only a few years ago that physicians were regarded as quacks in comparison with what they are to-day. Why do we not take a higher stand than we do?

We have made great progress in the last few years. The pictures on our walls, many of them, are works of art. Why should we not have lectures that would develop this art and cultivate photographers as a whole, and thus enable them to take a stand in advance of that which the majority take to-day? I think myself that while competition has done much to benefit us, it has done much to lower us. When we get fewer men we get better prices. The more men that come in, the lower our standing is. We ought to have lectures by eminent artists accustomed to the camera and to the working of strong effects, who can give us instructions that will benefit us and raise the standard. I would say that I hope that this fund will be largely augmented by calling upon men in all classes of photography, those who make photo-gravures, and men who are engaged in book publications, so that we may have a magnificent monument erected to Daguerre's memory.

Dr. ELLIOTT—In connection with the subject of erecting a monument, it is well to remember that there are a great many States in the Union, and that men will contribute from all these States. Where are we going to place the monument when we get it?

Mr. RANGER—Move it around. Carry it to Washington next year, and so on.

Dr. ELLIOTT—You must remember, gentlemen, we have no permanent abiding place, no home. We are peripatetics.

A Voice—We are tramps.

Dr. ELLIOTT—I am strongly in favor of a statue or memorial of Daguerre, but we must not forget that we have got to put it somewhere. We cannot carry it around in our pockets.

A Member—How would the Central Park of New York do?

Dr. ELLIOTT—I would be perfectly well satisfied with that. I would like to have it there. That is a good place. But some other fellow would like to have it in Chicago. That is the center of the country, they say.

Mr. RYDER—In response to the question of Dr. Elliott, I would say that I have two places in my mind where a tablet to the memory of Daguerre could be very appropriately placed, I think. First, the City of Boston, being the place of our first meeting and being the city in which we hold our semi-centennial meeting, a city that has been very kind to us. It has a Common that would hold very creditably such a tablet. I would suggest the City of Boston. Next to that, the City of Washington. All that can be determined by your committee.

I do not think we would find it necessary to carry it around in our pockets from city to city or anything of the kind. I think it is a matter of sufficient gravity not to be treated as a matter of fun, exactly. I think there is something in it, and I would like to see it carried through.

Dr. ELLIOTT—I had no idea of treating it as a matter of fun. But I have been on committees of this kind before, where they had decided to do something of this nature, without going into any details, and where the committee in charge of it has found itself in a dilemma, not knowing what to do. And therefore I think it would be wise, at this time, to make some decision as to where we shall put it. I have no doubt that we can succeed in erecting a monument.

Mr. BOGARDUS—Speaking of a place to keep your monument of Daguerre, reminds me that some ten or fifteen years ago I had presented to me for the old association the original camera with which Professor Morse made his first daguerreotypes in New York City. I had the camera with its lens brought before the Association, I think at St. Louis. It was on exhibition there, and it passed into the hands of our then Treasurer, Mr. Moore, of Philadelphia, and after the Association was *non est* I never heard from it again. That thing ought to be looked after. It should be kept with your monument of Daguerre. Understand me again, that this was the first apparatus made in America to take pictures with, and was presented to me by Professor Morse, the inventor of the telegraph.

(Mr. Ryder's motion was then carried. The motion was to the effect that the officers of the Association be a committee to receive funds for a monument to Daguerre.)

Mr. RYDER—A good time to do a thing is when we are about it. Now I move you that some envelopes, if we have them, should be circulated among the audience, allowing every man to insert his dollar with his name and address upon it. Or let each gentleman so disposed come and register his name and address and contribute his dollar. It is a good time to start a little collection this morning.

Mr. LONG—Being one of the old men present, I would like to have the pleasure of making the second contribution to that fund. (Presenting a dollar.)

The previous question was then called for.

The President—The ballot stands: Washington, 123; Buffalo, 66.

The Convention was then adjourned to 8 P.M.

Third Session.

BOSTON, August 7, 1889, 8.30 P.M.

President McMICHAEL—The meeting will please come to order. This is a special session for presentation of papers and discussion of same. We will now have the pleasure of listening to a paper by Mr. G. D. Milburn, of the Eastman "Dry Plate and Film Company," Rochester, N. Y.

BOSTON, August 7, 1889.

Ladies and Gentlemen,—With your kind permission, I will read you a few explanatory remarks on the Eastman "Transparent Film," as that is the very latest discovery of any great value to the photographic fraternity. (See page 495.)

The *President*—We will now listen to Mr. Carbutt. (See page 496.)

Mr. MILBURN—It is a good thing that you are all professional photographers to whom I am talking. For, as to any claim that Mr. Eastman is the inventor of this film, that is not the idea I tried to convey. It is this way: The celluloid, as I understand it, is made from emulsion; it is an emulsion, and you can alter it in almost any way, such as introducing a salt. Now, we claim that we have put something into this emulsion or celluloid whereby we can make it finer and more transparent and more perfect. As to the statement that we invented it, that is a wrong statement, but we claim to have brought it into the perfect condition in which you find it now. And again as to the spots I have talked about, I did not try to convey the impression that the film could not be stretched smooth. But I have seen negatives from some of the films already on the market that showed spots of something like a vine or tree. And, as I understand, that is due to the unequal distribution of camphor in the film. We claim that we have overcome that.

The *President*—Are there any more remarks on this subject or any questions to be asked?

A *Member*—I would like the privilege of asking Mr. Carbutt if he can explain the cause of opaque as well as transparent spots on various specimens of celluloid films that have been in the market.

Mr. CARBUTT—The transparent spots are, in a measure, accountable for. They either arise from dust on the film at the time of exposure, or, in some instances, they have arisen, as I have ascertained by an examination made under the microscope, by small points in the film, which, being brought to the surface of the emulsion, make a little cone there. The emulsion is separated during the setting. This is palpable to the touch of the finger nail, by just scraping the film off. A little point is found there so small that it is invisible to the naked eye in looking over the surface; but it is sufficient to affect the emulsion so as to spread it away, leaving a little cavity. I have had some films shown me that were badly marked with transparent spots, which were merely air bells. I at first suggested wetting the film. That is a good plan if you wet it

thoroughly. But if you simply pour the liquid on and off, you are almost sure to make air bells, because the gelatine surface does not absorb sufficiently to make it flow smoothly. Now I wet the bottom of my developing tray, and the film lies perfectly flat, and then you can pour your developer over it, as over the ordinary dry plate. The developer is just simply poured over and not touched at all, and the development is complete. We are trying to eliminate all those difficulties. Some of the marks that appear on the films I cannot explain the cause of, but I believe they are in the nature of the film, and that that has caused it until recently. And I say now that for nearly a month past I have been able to obviate it. Whether it is my own doing or whether it is because of a change made in the celluloid, I do not know. The manufacturers wrote me that all sent out after May 1st would be of an improved nature. They do not tell me what change they make in the preparation of it, but it shows that they are progressing and investigating the difficulties that have surrounded the making of this almost perfect substitute for glass until it has now arrived at a very good state of perfection. They will leave nothing undone in the future to make it absolutely perfect.

The *President*—Is there any one else who has any questions to ask?

Gentlemen, we have with us to-night the celebrated optician, Alvin W. Clark, who will talk for a few minutes on lenses. Mr. Clark built the celebrated telescope of the Lick Observatory, I believe.

Mr. ALVIN W. CLARK—I do not know why I have been called upon to speak to you here this evening. I am not, and never have been, a member of the Association, but the President has kindly asked me to say something to you about lenses. Now, while I confess that I know more about astronomical lenses than I do about photographic lenses, still I do not consider myself exactly an amateur in photographic lenses. Over thirty years ago—I think thirty-five years ago—I made, or we made, my brother and myself, a photographic lens for Messrs. Whitten & Black. They worked with it a good many years. That is still in existence, and once in a while it is put to use at the present time. We have had it in our factory within a year. It is a very good lens, but has a very short focus—too short for the work that the photographers want to do at the present time. If the lens were of twice the focus that it is, I have no doubt it would be a very useful lens; it having been made so long ago, the material of which it is made is not so good as we can get at the present time. And another thing, we did not understand photography as well as it is understood to-day. Photography was in its infancy then, and we did not understand the corrections which were necessary to produce the best results in a photographic lens. But I sometimes think the photographers do not understand it either, because they insist upon it that the visual and photographic focus should coincide. Theoretically, that is not right. And I contend that after you have focused as sharply as you can on your ground glass—your ground glass being the proper

place—if you find that it does not cut exactly sharp, if you find this improved by putting the glass nearer the object glass—that is, carrying your glass in—you will get better results, you will get sharper results and your lens will work quicker. There are a great many lenses on the market now that are called rapid rectilinear lenses, and most of them are alike. There is but very little difference in them. And I was surprised, when I first saw them, to know how the spherical aberration could be corrected on such a lens. And on close examination and measuring, I found it was absolutely impossible to do it with spherical curves, and that these lenses are not spherical curves. They are considerably off from a spherical curve. They make a lens that I should suppose would be a great deal more liable to be unequal—that is, one go one way and another one another way. It is very difficult for any one to polish a lens unless a lens is spherical. But these lenses I have, in the case of all of them, if you polish them spherically, are what we term short outside and long in the center. That is, the rays of light pass through the outside portions of the glass and come to a focus before those that pass through the center of the glass. But they have managed to correct them by some means, I do not know what. Now, I have done a great deal of work for astronomical photographers. With those instruments we always make the correction so that the plate will go inside of the visual focus—the visual focus of the photographic lens. In that way you get sharper results, and the lens will work a little quicker. But what we call sharper would be quite different from what you would call it in an ordinary landscape view or in a portrait. We have been endeavoring to get a lens that will cover five degrees, and we have not got anything that will give us absolutely sharp result for five degrees.

(To be Continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—W. S. W. writes: Will you kindly give me the formula used in toning the print used to illustrate BULLETIN of August 10th?

Q.—M. R. M. also writes: Will you please give me the formula of the toning bath that your printer used in No. 15 of the BULLETIN portrait of Winifred, by E. Decker?

A.—The bath used for toning the Winifred picture was made as follows:

Sal soda (sat. solution) ..	4 drams.
Salt	128 grains.
Water	80 ounces.
Gold according to quantity of prints,	

The bath is used from two to six months, adding gold daily.

Q.—H. C. writes: In looking over the file of BULLETINS for 1886 I find, in the February number, an article on "The Magic Lantern and its Applications," in which is the statement that "oxygen gas is manufactured in large quantities and compressed in metal cylinders for transportation." Will you kindly inform me where such gas may be obtained?

A.—The compressed gases for lanterns can be obtained of Charles Beseler, 218 Centre street, New York City.

Q.—C. H. K. writes: Can you tell me of a book that will furnish me with a good history of Daguerre, one of the inventors of photography, and also some account of the progress of the art since the advent of daguerreotypes?

A.—Read the "History of Photography," by W. Jerome Harrison. It can be obtained from our publishers.

Q.—A. W. N. writes: Please let me know through the columns of the BULLETIN how to make good hard flint negative varnish that will not stick by printing in the direct sunshine in hot weather. By so doing you will confer a favor, and no doubt do a great deal of good to a great many photographers.

A.—It is not possible to make such a varnish in small quantities, and the formulas used by the manufacturers are too valuable for them to publish them. There is a good formula in the "Silver Sunbeam," issued by our publishers, but it takes care and practice to get a good result. (See page 139, "Silver Sunbeam.")

Q.—L. F. D. writes: Will you kindly give me the formula for toning bath by which the photograph in No. 3, Vol. 20 of BULLETIN was made? I like the tone very much.

A.—The prints were made by Ulrich, of 156 Bowery, New York. By writing him a note you may probably get the formula.

Q.—H. S. writes: Will you please inform me what kind of toning bath was used in toning the picture (Winifred) in the last number? I use N. P. A. paper, but cannot get any such tone. My bath is from 50 to 55 (nothing but silver and ice water). I place the prints in acid water (acetic), after the first washing (I wash my prints in running water), till they turn red, then wash well before toning. I have used numerous baths, but cannot get a tone like that in the above named picture.

A.—Leave out the acid bath at the begin-

ning; don't wash too much, and use the toning bath given above in the answer to W. S. W. and M. R. M.

Views Caught with the Drop Shutter.

MR. ROSCH, of St. Louis, the prize winner at the Boston Convention, gave us a call before his return home.

STOLEN.—From C. G. Hill, 363 Washington Street, Boston, Mass., one 8x10 Rapid Rectilinear lens, made by J. H. Dallmeyer, No. 18,237. Was taken July 31st last.

THE photographic fiend is abroad—the very worst species of this particular fiend—the amateur.

As a rule he not only knows more than the “professional” about almost everything, but sometimes has been lavishly endowed by nature with wit. I met one of the species as he was trudging into the Spring House, with his “Lilliput” in one hand and some sort of an apparatus in the other.

“Where have you been?” I asked.

“To Van Hornesville,” responded the amateur.

“Get anything?”

“Yes.”

“What?”

“Tired.”

His appearance was proof of his truthfulness, for a dustier, more dilapidated and generally demoralized photographic fiend has not been seen at Richfield this summer.—*Richfield News*.

R. BROUDE & COMPANY, of Pittsburgh, Pa., have become incorporated under the firm name of Broude Manufacturing Company, and have added another house to those they have hitherto occupied. Their address is now 242, 244 & 246 Fifth avenue and 21, 25 & 27 Watson street, Pittsburgh. The addition has become necessary on account of increased business. We congratulate them.

OSCAR FOSS, of 841 Mission street, San Francisco, has opened a new store at 621 Market street, in the same city. With increased facilities, he expects to meet all the demands of his customers.

APROPOS of the recent Convention, a pleasing story is related of Mr. G. L. Damon, the genial proprietor of the Harvard Dry Plate Company. After being introduced to a Western photographer as “Mr. Damon, of the Harvard Dry Plate Company,” Mr. Damon was asked if he was the demonstrator of the Company. “No,” he pleasantly replied, “but I am the Damon-strator.”

“ILLUSTRATED BOSTON.”—A set of sixty-seven slides, prepared by members of the Boston Camera Club, accompanied by a typewritten lecture, will be loaned to such amateur photographic societies as desire to use it in giving an evening's entertainment. A circuit will be arranged for the approaching season among such clubs as make application before the 7th of October next. Address WM. GARRISON REED, *Treasurer*, 25 Kilby street, Boston, Mass.

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THE SPHINX.

ANTHONY'S Photographic Bulletin.

Prof. **CHARLES F. CHANDLER**, Ph.D., LL.D., *Editor*.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

SEPTEMBER 28, 1889.

Vol. XX.—No. 18.

THE PICTURES AT THE BOSTON CONVENTION.

SECOND NOTICE.

HALL, of Buffalo, had an exhibit that was particularly good in large work. A picture of a girl with a straw hat on, was one of the best in the exhibition; the management of the light gave excellent modeling and the figure was very gracefully posed. Another picture, a lady with a satin dress, was also very finely done. A similar one to the last, but of boudoir size, was a gem. The whole exhibit was uncommonly fine.

Bowersox, of Dayton, O., had an excellent exhibit of cabinets, and his architectural work was of a high order.

Park & Co., of Brantford, Ontario, Canada, had a display of pictures that showed skill and good taste in everything but the retouching. In this last particular we cannot help thinking that the excessive work upon the negatives gives a waxy appearance to the flesh.

Near the last exhibit we noted upon the floor, and placed one upon the other, a number of pictures from Mr. G. B. Wood, of Philadelphia. For some reason or other these were not hung. They were a number of studies in his usual style of genre work, and thoroughly artistic. We are sorry that they were not in a position for examination.

G. M. Elton, the well known artist, of Palmyra, N. Y., had one of the best displays of genre work he has ever made. "Devotion" was a picture representing an old couple seated at a table, the good woman at work, while the old man is reading the Bible. The artistic arrangement of the couple at the table, the lighting and general effect of the picture, were admirable. Another one equally good was "Relaxation," an old dame enjoying a smoke with a clay pipe. "Bucked Out," an old man with a buck and saw, resting after his spell of labor at some cord wood. Several other pictures in the same exhibit were equally well done, but not quite so striking as genre pictures.

Rösch, of St. Louis, had a fine display of genre pictures, six in one frame. One was "Shadows," showing wall shadows of a group with children; another, called "Light," was a lamp post, with a small boy lighting his cigarette; "The Choir" was a well planned group of singers. "Boston," with the word "beans" on the wall, was a countryman enjoying the favorite New England relish; while

the other two represented an unsophisticated looking individual in the act of picking up a pocket-book on the side-walk and his astonishment at seeing it disappear; the titles being, "Now you see it," and "Now you don't."

The same exhibitor had the exhibit of three pictures illustrating "Evangeline" which took the Grand Prize. There is no doubt these pictures were the result of great study upon the poem, and it is impossible to give in words anything like a fair description of the work. It was artistic, fine photography, with skillful management of the subject and accessories. The three pictures illustrated Evangeline's youth, her wandering in the moonlight, and her life as a nun.

J. H. Ryder, Cleveland, O., had two quite attractive pictures in his display; they were entitled "June" and "December." While the figures were excellent and the general photographic work was of a high order, it appeared to us that the pictures were somewhat bare from lack of background and accessories. It is a pity that such good work should be marred from the lack of such simple devices for artistic effect.

Walter Histed, of Pittsburgh, Pa., had one of the best single pictures illustrating "Evangeline." It was a view of Evangeline at the spinning wheel. The scene was very artistic. The fine lighting through an open window, the sense of action at the wheel, the bold relief of the figure and the skillful use of the accessories made a picture of remarkable beauty. The other two pictures of the exhibit were fine, but not as good as the one we mentioned. The entire exhibit would have been much more effective if the pictures had been mounted with margins, instead of being set in frames alone.

W. Stuber & Bro., of Louisville, had an exhibit of pictures that were notable for the fine photographic work and artistic taste displayed in their production. The "Evangeline" pictures represented Evangeline walking in moonlight, the old men at the table with the lovers apart, and the death of Gabriel. Each was finely executed and had many admirers at the exhibition.

C. W. Motes, of Atlanta, Ga., had three of the best pictures in the exhibition illustrating "Evangeline." The first of these represented the pedagogue, Father Felician, and the children Gabriel and Evangeline in their early youth; the next was the scene where Evangeline and Gabriel are sitting apart in the embrasure of a window, while the notary and her father are sitting together at the table playing checkers; and the third was a picture of Father Felician and Evangeline when she is telling him of Gabriel, her lost lover. The pictures were of some of the sweetest episodes in the poem, and were presented in a thoroughly artistic manner. There was something so thoroughly poetical about them that the observer felt constrained to linger and take in the many beautiful thoughts that they conveyed to him from the poet. Altogether this exhibit was one of the masterpieces of the collection at Boston.

Another remarkable set of pictures illustrating "Evangeline" was from the studio of Montfort & Hill, Burlington, Iowa. The scenes represented were, Evangeline bearing to the reapers the home-brewed ale, Evangeline waiting in expectation of Gabriel, and the death of Gabriel. We do not think the death scene was a pleasing episode to represent, nevertheless it was well done. The other two pictures were singularly effective and full of artistic merit.

Coover, of Iowa City, had an exhibit illustrating "Evangeline," embracing the scenes where the heroine is wandering in the moonlight, where she is spinning, and also the death scene. The latter was objectionable for the same reason

that was given above. The other two pictures were well done and had much in them to be admired.

Another exhibit that was particularly effective was from the studio of C. H. Stoddart, of Erie, Pa. The first picture represented the children at the door of Basil's blacksmith shop, the second showed Evangeline spinning and listening for Gabriel's footsteps, while the third represented Benedict and the notary at the table, with the lovers at the window embrasure. Here again were three pictures full of poetic feeling and very artistically treated. The blacksmith shop was a particularly effective piece of work, thoroughly well thought out and skillfully executed. The two other pictures were also well worked out and very artistic.

Stein, of Milwaukee, showed a number of very fine studies. Among others of excellent value we noted "Aunt Tillie's Story," an old darky woman sitting at her cabin door peeling potatoes, while a pickaninny lies prostrate before her, his heels in the air and his hands supporting his chin, evidently much interested in what she is saying. The picture was very artistically managed and the genre idea thoroughly well carried out. In fact, it was one of the best in the exhibition. Others in the same collection that were notable were, "Confidential" (two ladies in conversation) and "Outing" (a stern scene on the deck of a boat), both of which were remarkably fine pieces of artistic photography.

A. H. Plecker, of Lynchburg, Va., had an exhibit illustrating "Evangeline" that represented Evangeline in the woods, the spinning scene, and the scene at the Indian tent. They were all good, in spite of a few faults in the use of accessories.

The same exhibitor had a capital genre picture, entitled "Knowledge is Power," representing a colored boy asleep over a book which lies in his lap. It was excellently well done and had many admirers.

Dixon, of Toronto, had a collection of every-day work that showed progress and skillful photography. The large portraits were very finely done and the cabinet pictures excellent.

Sittler, of Springfield, Mo., exhibited a small banner of photographs on silk. This work is very difficult to do well, and the examples given were very well done.

Hurd, of Providence, had a small but artistic exhibit. The portrait heads were very fine, following the line of work of the old painters and bringing the prominent features of the face strongly into relief. The head of a lady and also a portrait of Ruzan were very effective. In the line of study the "Ancient Harpist" was very good, but we think the use of a few simple accessories would have improved it somewhat. The work of this exhibitor is always worth study and is singularly unpretentious.

Hastings, of Boston, had one of the most artistic collections in the exhibition. A snow scene with toboggan slide, showing groups of children, and colored, was a charming picture. Another picture, also colored, was a view on the seashore, full of life and artistic beauty. In plain photography, the view of a lady sitting on a stone bench in a garden, with stone wall background, was very finely done. But the gem of the collection was a group of four small ladies' heads upon a gold background with embossed stars. In these the exquisite coloring and the fine quality of the work made it an object of great beauty, and also an evidence of the skill of the artist who executed it.

George Steckel, of Los Angeles, Cal., had an excellent collection of pictures, portraits and groups of minor sizes. In this collection was found one of the finest pieces of grouping we have ever seen. It consisted of fourteen ladies in light colored draperies (not ballet girls), and so artistically arranged that every face and form was distinct and unobstructed. It was a work of art in grouping and had hosts of admirers.

Appleton, of Dayton and Cleveland, O., had an excellent collection of pictures. "Boudoir Gossip," two ladies in morning wrappers in a boudoir, was a fine piece of work, pretty posing and fine modeling making a picture of singular beauty. Another equally good was "The Confidantes," two ladies in conversation in another interior. Two large pictures, one a three-quarter standing figure of a lady apparently in meditation, another a picture of a lady seated, also three-quarter figure, were very artistic and graceful. The shaded background, the skillful management of the light to produce delicate modeling, and the graceful posing, all helped to produce pictures of great beauty. Other pictures in the same exhibit were equally good; but our space is limited.

Scott, of Chicago, as usual, had some very fine work. All his pictures showed skill and great care in their production. They were very free from faults in minor details. The pictures entitled "Not Alone" and "Flirtation" were uncommonly fine studies and should be seen to be appreciated. The ideas they were intended to convey were evident from the pictures, and the work of the artist was skillfully performed. Mr. Scott is destined to be more famous than he is at present, if he continues to improve. Among the other pictures in the same exhibit we noted "Girl and Old Man," "Blind" and "Girl with Harp," as those that pleased us best in an excellent collection.

Want of space compels us to defer until the next issue of the BULLETIN our observations upon a few more exhibits.

EDITORIAL NOTES.

WHEN we published our list of the awards given at the Boston Exhibition we were not in possession of the official reports of the judges. These have recently come to hand, and we find that two names were omitted. In Class B, S. J. Dixon, of Toronto, obtained a silver medal, and E. F. Hall, of Buffalo, a bronze medal; while in Class D (for retouching), the silver medal went to A. V. Cunningham, of Chicago.

THE American Institute Fair is to be opened on October 2d this year, and we hope that photography will be well represented. Would it not be a good idea to have a historical collection of photographic apparatus on exhibition? We think there is enough of this interesting material around New York to make an extremely interesting feature of the photographic department. We also hope that more of the New York photographers will take part in the exhibition than has been the case in former years.

OUR good friend, B. L. H. Dabbs, of Pittsburgh, has presented us with a number of his beautiful cabinet pictures. They are some of the finest pieces of photographic work we have seen for some time. The arrangement of the background is very artistic, the modeling of the figure always soft and delicate, and the general appearance of the pictures gives evidence of skillful photography all

through, the expression of the face being particularly life-like. We regret that Mr. Dabbs did not exhibit some of his fine work at the Boston Convention.

MR. JOHN E. DUMONT, of Rochester, the well known amateur photographer, sent us some time ago a capital study entitled "Hello." It represents a lady in a sun-bonnet, with her hands to her mouth, apparently making the above named call. The surroundings are a stone wall, with trees in the background and field grass at her feet. The scene is quite rustic and the action of the subject well caught, making a very pretty picture. We cannot help thinking, however, that the cluster of straight tree trunks immediately behind the head somewhat mars the beauty of the view.

THE Cranford Camera Club, of New Jersey, entered upon its second year of existence on September 1st, electing William Chamberlain *President*, and A. H. Plummer *Secretary*. We presume the other officers remain as last year.

AT the next regular meeting of the Photographic Section of the American Institute, Tuesday, October 1st, Professor Randall Spaulding, of Montclair, N. J., will give a lantern exhibition, entitled "Scenes in Great Britain." We are sure that it will be well worth seeing, as Professor Spaulding has some excellent pictures, and is well able to describe them in an interesting manner.

ENGLISH NOTES.

THE fourth "Convention" of British photographers was held in London during the week commencing August 19th. The previous meetings—at Derby, Glasgow and Birmingham—have been "moderate successes," and it cannot be said that the metropolitan gathering reached a higher level. It is probable that in each case the weather has had a good deal to do with the result; the convention has not yet had a fine week, and this is an important factor in the matter.

The building selected for the meeting was St. James' Hall, in Piccadilly, a most suitable location in the "West End" or aristocratic part of London. The President for the year was Andrew Pringle (the originator of the movement), who was supported by J. Traill Taylor (ex-President), J. J. Briginshaw (Honorary Secretary) and many others, the total membership amounting to about two hundred and fifty. On entering the St. James' Great Hall, we find one-half of it filled with a representative collection of photographic apparatus, exhibited by such firms as the Eastman Company, Fry & Company, Swift & Sons, Dallmeyer, Thomas & Company, Beck, Watson, Edwards and others. The end next the platform is reserved as an auditorium, while the walls are adorned with a collection of photographs by some of the best workers of the day. The rent of the hall was £100 for the week; but the amount paid by the various firms for space, together with the members' subscriptions (five shillings per annum), proved sufficient this year to defray the expenses. Last year, at Birmingham, there was a considerable deficit, and the Birmingham members raised over £50 (over and above their subscriptions) to defray expenses. It is perhaps needless to say that they have received small thanks (but rather obloquy) for this. However, the result has been that no invitation from any British society was forwarded to the

Convention, and the next meeting is to be held at Chester, where it is hoped that an energetic local photographer (Mr. G. W. Webster) will be able to persuade the local scientists into affording some sort of welcome to the "poor lame body."

To return to the London proceedings, however; the officials ran about, and by endeavoring to be in two places at once, gave quite a lively air, at intervals, to the meeting. The President's address dealt with the history of photography; but this, as well as other still more watered-down papers by Messrs. Friese, Greene and Ashman, contained only facts which surely every photographer must have heard or read many times before. The veteran Traill Taylor again discoursed on optical questions ("Lenses for Hand or Detective Cameras"), and so, it is needless to say, did Mr. Dallmeyer ("False Rendering of Photographic Images by the Misapplication of Lenses") Mr. Bothamley (who was elected President for the coming year) gave his usual Convention paper on "Orthochromatic Photography," while Mr. Bolas discoursed on the "Photo-Mechanical Printing Processes Now in Use," and Mr. Haddon on "Desensitizing and Resensitizing Albumenized Paper." Mr. Dunmore's paper on "A Method for Ascertaining the Comparative Rapidity and Printing Value of Gelatino-bromide Plates" advocated the securing of a set of standard negatives (which could be multiplied to any extent by making a carbon transparency and then copying), showing under, over and correct exposures—the time of development being the same for all. To test any other plate, let it be exposed and developed identically, as was the "correct" plate of the above series. Comparison with the series will then show the comparative rapidity of the plate which is being tested.

In addition to these papers, a committee which had been appointed at the Birmingham Convention presented a report on "Lens Standards, Including Screws, Diaphragms, Etc." This report was, however, referred back for further consideration.

Over the publication of the papers read there was a very pretty journalistic quarrel. It was stated in the first case that they were "copyrighted for a week"; but afterwards—too late for half the papers—some officious official took upon himself (without the consent of the Council) to set this arrangement aside; with the result that the other photographic papers (we have now five weeklies in this country) published them. Hence these tears! In previous years the Convention has been left to manage itself, after the good old English fashion; but if the Convention is to hold another meeting there must be a radical change in this respect.

The excursions were—as usual—more or less spoiled by dull and showery weather. They included trips to Windsor Castle; Kew Observatory; up the River Thames to Hampton Court, etc., and down the river to Gravesend. On Friday night the members assembled at that truly British institution—a dinner—and on Saturday a group of about one hundred members was secured on a 20 x 16 plate by Mr. Friese Greene.

Before concluding, I must not forget to note that the success of the meeting was the illustrated lecture by that talented American photographer, Mr. E. Muybrige, on "The Movements of Animals." But I must dissent from his estimation of the rapidity of his shutter, which he puts at the $\frac{1}{3800}$ of a second; I believe the $\frac{1}{750}$ of a second would be nearer the mark; but even this is very wonderful.

Before leaving the Convention, we would again point out how desirable it is to consolidate "the powers that be." Here we have the Photographic Society of Great Britain, the Camera Club and the Photographic Convention—three bodies doing the work (and doing it very imperfectly) which should be done by one powerful incorporated society, which should represent British photographers as a whole. Such a society should obtain a Royal charter (which could be easily done, although it would involve an expense of about £250); it would possess spacious club premises in London; it would hold an "excursion week" annually in June, selecting the most beautiful parts of the country, in turn, for this purpose; while in the autumn its combined London Exhibition and Conference would attract even foreign workers to our shores. Can it be denied that such a consolidation would be advantageous for the individual and for the art?

My space is nearly exhausted, but I must describe a plan devised by the members of a party while returning from a photographic trip, to pass away the long hours in the train after dark. One member had (by previous agreement) brought a small sciopticon lantern, and a four-foot square transparent sheet; while the others had each added a dozen lantern slides to their equipment. The sheet was suspended in the center of the saloon carriage in which the party were traveling, the lantern placed at one end, and the carriage lamps covered over with focusing cloths pinned to the wood-work. Then the show began. But the best fun was at the stations, when a window was opened and a picture suddenly thrown on a whitewashed wall; while at one time a white fog served as a screen on which "statuary effects" looked like ghosts flitting along with the train. Truly, photography is a "companionable art," and I have always found its professors the best of good company, willing to aid and help one another in every way. "Photographers brothers, all the world over!" is the motto of

TALBOT ARCHER.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

America at the Berlin Photographic Exhibition—Platinotype Prints and Color Sensitive Plates—Dead Amateurs as Working Competitors to Living Photographers—The Action of Envelopes and Wrapping Paper as Preservers of Gelatine Plates.

OUR Berlin Photographic Exhibition is open, and has assumed greater dimensions than we dared to hope for and beyond our expectations. The American contributions arrived in time, and as a matter of course you are anxious to know what impression they have made.

It gives me pleasure that I can report to you only favorably, very favorably, about them. Your countrymen have given rise to astonishment and surprise. First rate! That is the general verdict about the American exhibits. Still there is only one American exhibitor of portraits, Mr. Kirkland, of Cheyenne, and it is altogether a peculiarity of this exhibition, that it lacks in portraits; but in their place it has an abundance of fine and rich landscapes, scientific pictures, reproductions and photo-mechanical prints, besides a rich collection of apparatus, chemicals and historic pictures.

In the landscape branch it is again a man of the far West, but well known throughout the United States, Mr. Jackson, of Denver, who has distinguished

himself ahead of all. Such powerful prints of 20 x 74 inches have not been looked at here before. To this is to be added the technical superiority and the wonderful scenery which captivated our public, and has given them for the first time a true impression of the picturesque Far West of the United States of America. Crowds of people constantly surround these pictures.

The United States does not excel less in the scientific branch. Such a solar spectrum as that of Professor Rowland, of Baltimore, 40 feet in length, was never made here, at least with a grating. The view of the yellow and red part, which could be done only with color sensitive plates, is admirable. The magnificent concave grating, with 25,000 lines to the square inch, also exhibited by Professor Rowland, is unsurpassed in Europe. It was sold at once, of course, and Professor Kayser, of Hanover, who is ardently occupied with spectrum studies, is the fortunate purchaser and owner.

The Messrs. Pickering Brothers, of Harvard College, obtained equally high honors with their wonderful star photographs and star spectra. Such pictures as those of the Jupiter and Saturn moons have not been attempted yet here by anybody, and they will give quite a new impulse to our star photography. The same may also be said of the star spectra, which have a brilliancy as if they were views of the solar spectrum. In comparison with these masterpieces, some of the European works of a similar nature have a very incomplete appearance.

The Lick Observatory, in the United States, has favored us with a large transit of Venus picture, and a moon picture, taken in the principal focus of the big telescope.

The excellent reproductions of oil paintings by Mr. Kurtz, in New York, taken on azalin plates, leave also all European copies from the same originals far behind.

You see, therefore, that the participation from the United States has not been very extended; but what they have sent us is first rate.

Besides this, I may say about the exhibition that it will open a new field to us. It will be active in two directions—the general acknowledgment of the platinum print and the color sensitive plates. Quite a number of exhibitors have executed portraits in platinum, which pleased the public excellently, and just as large is the number of exhibitors of landscapes and portraits with color sensitive eosin silver plates (eoside of silver plates), taken without yellow screen.

Still there are some people who to the present day disregard the color sensitive plates. Thus the President of a photographic society in England declared to me, not a year ago, that he had never applied color sensitive plates, and would not use them. To better inform himself, I would recommend to that gentleman a visit to the Berlin exhibition, and an hour would be sufficient to convert him.

At this time I would like to remark that the expressions "isochromatic" and "orthochromatic," in general use in the United States as well as in England, are both wrong. Isochromatic means "equal in color"; the meaning of orthochromatic is "correct in color." Is there, therefore, any sense in speaking about isochromatic or orthochromatic photography? The process is not chromatic (colored), and still much less the pictures! Besides this, the so-called isochromatic plates or processes are not all equally sensitive for all colors, and also not absolutely correct in sensitiveness; they only approach the ideal. Therefore I

say "color sensitive," because it is a fact that the color sensitive plates have a sensitiveness for different colors (green, yellow, red), while the ordinary plates are actually sensitive for one color only—for blue. At some later time I will prove that their sensitiveness for violet and ultra-violet is of importance only with regard to light sources and spectrum views in red; for the very simple reason that the non-luminous bodies reflect very little violet and ultra-violet light, its action showing itself first during exposures which require a much longer time than the ordinary photographic exposure.

So far the professional photographers have been afraid of the living amateurs, but what will they say about dead amateurs entering the arena as competitors?

In all cities and towns are to be found the well known automatons, which, by placing a small coin in the designated place, give you a cigar or candy and tell your weight. But automatons furnishing your portrait are new. This was considered a swindle; but at the Hamburg Exhibition such an automaton was actually shown, and the same will furnish your portrait on the payment of fifty pfennigs. The inventor, Mr. Cristel Fröge, is a talented young mechanic, and has taken out patent rights in all countries. By putting a coin into the apparatus a clock-work is set in motion, and causes a plate to slide from the magazine to behind the objective, an instantaneous shutter opens and the picture is made. The clock-work next plunges the ferrotype plate into a developing bath (eikonogen) and lifts it again, while the inner arrangement turns and places it in the fixing bath, which in turn comes directly under the plate. The plate is lifted once more and another turn furnishes the third dish, in which the plate is washed. After five minutes the picture is ready for delivery. A disk on the outside of the automaton is so arranged that it will indicate the correct working of the apparatus, which, in this way, can be easily controlled. By putting another fifty pfennigs into the apparatus a handsome frame can be had for the picture. Mr. Fröge has fifteen different automatons besides the above in his pavilion. They will give you electricity, Selters water, salt, perfume, flowers, cigars, etc. Unfortunately the inventor could not finish in time a second photographic apparatus for the Berlin Exhibition, which would have been greatly admired here. This is actually making a machine of our beautiful art. But, as real music cannot be supplied by the organ grinder, no automaton will be able to degrade our beautiful art.

Recently my son, E. Vogel, made some interesting experiments regarding the formation of black edges on dry plates. He had proven before that the impurities of the wrapping paper are the cause of this defect. Lately he has tested numerous kinds of paper with regard to their action on dry plates. The method, published by him before, was to test the papers by mixing the aqueous extract, which can be obtained by boiling the papers with a solution of nitrate of silver, but this will not always give conclusive results. If, for instance, a paper is impregnated with negative varnish and is afterwards boiled in water, the aqueous extract of this paper will act less upon nitrate of silver than the one which was not prepared with varnish. But a practical test will show the reverse. Burnished and unburnished papers of the same kind show a like result in a chemical test, but in a practical test the burnished paper will prove to be more useful.

He proceeds now as follows: From the several papers to be tested he cuts out a certain figure—for instance, a cross—and brings the same (in the printing

frame) in the dark room in contact with the dry plate film. To avoid mistakes, papers as well as dry plates are numbered. After at least a week (a longer time is better), all plates are developed simultaneously and an equal length of time. Bad papers will give a complete copy, leaving nothing to be desired regarding strength, etc. In this way a complete scale of the utility of the several papers can be obtained. For this test it is best to take color sensitive plates or ordinary plates of high sensitiveness, because they are most sensitive to the evaporation of the paper. The actual reason of the hurtful influence of some of these papers has not been definitely determined yet. Undoubtedly they consist of gases (sulphurous acid), which cause the decomposition; at least he has made the observation that impure paper will even act through pure porous paper.

By testing the most popular papers, the following table was the result after eight days :

VERY STRONG ACTION.

1. Rough black paper.
2. " " " burnished.
3. Smooth " "
4. Ordinary writing paper.

WEAK ACTION.

5. Photographic plain paper.
6. Yellow smooth wrapping paper.
7. Filter paper.

NO ACTION.

8. Swedish filter paper.
9. Tissue paper.
10. Tissue paper impregnated with paraffin.

That even plain photographic paper, which is supposed to be the most pure, should number among the papers of bad action, may surprise many. But it is a fact that extracts from this paper would even reduce silver salts. Of what importance the selection of the proper wrapping paper—particularly for a tropical climate—is, can be proven by the fact that all negatives taken by the explorer, Captain Kundt, in Cameroon, Africa, arrived here in a decomposed condition, although the plates were of Monckhoven's make, whose good quality is beyond doubt.

BERLIN, August, 1889.

SWING-BACK ATTACHMENT FOR DETECTIVE CAMERAS.

BY MAJOR GEORGE SHORKLEY, U. S. A.

[Read before the Society of Amateur Photographers of New York, September 10, 1889.]

THIS camera swing is specially adapted to detective or hand cameras. You will notice that all its working parts are within the compass of the frame of the camera, and the adjustments are made as conveniently as the insertion of the holder, and from the same side or end, which makes it unusually convenient and easy of manipulation. It is not only a double swing, but a universal swing, as it will swing in all directions, pivoting, as it does, on a universal joint in rear or back of the center of the ground glass or plate-holder, and its swing may be made more

or less at the will of the operator, and is securely held as adjusted without the turning of a screw, and is as easily readjusted to a parallelism with the lens, which, of course, is its normal position. The operation of it is so simple that I need not describe it. You have but to move these two spring catches or guides back and forth in their ratchets—that is all.

One caution may be needed, however, and that is this. You notice that the pivot for the swing is back of and central with the plate-holder, and thereby secures the least possible displacement of focus of the lens when the swing is used. Now to adjust the swing properly you move one spring catch forward, or back, as you may wish to swing, and the opposite one in an inverse direction, thus equally dividing the swing of the holder upon its center.

In adjusting the swing it is found best to move first one catch, then the other, although both may be moved at the same time if desired. Now, after you have adjusted for perpendicular sufficient to bring the object on the plate to suit you, if you find your object has one side very much farther away from you than the other, and on account of the large stop necessary to use and your nearness to the object you fear, it will not be well defined. Suit your focus to a central part of the object, rather less than more, and then make a horizontal swing to suit. In making this adjustment move both spring catches alike, and in the same direction; this will enable you to get good definition throughout, when without the horizontal swing it would be impossible. Of course in time exposures the horizontal swing need not be used, as you can stop the lens down to suit your nearness to the object and definition be secured in that way.

In instantaneous or short exposures only a limited use of the swing is practicable, on account of the large stop necessary to use—to explain, we use for a 4 x 5 plate a 7-inch Beck lens; this has good covering power for this size plate, and we habitually use it with full opening, which is F. 8, and at 50 feet focus, and we get good results. Now if we use the vertical swing at the same focus we stop the lens down to F. 11, to get as good results as at F. 8 without the swing. Of course this might not be necessary could we go further away, and would not be necessary if we do not care for sharp definition over the whole plate.

A good swing seems to be needed on all cameras where it can be employed; and as much use, indeed more use, for it is found on the hand cameras than view cameras, especially if they be used for view work, for upon it we can have no raising front and must have resort to the swing to secure a like result. With our lenses, with their limited covering power, we find but little choice in the two devices; we use the raising front on the view cameras, because it is the most convenient, for if we use it, we must stop the lens down much the same as in using the swing; or we may find we have carried the lens off one side of the plate or put it in confusion; they are both means to the same end and are to be employed only when needed, and when needed are likely to be very much needed, and should be had if practicable.

In this swing we have about all that is possible in a swing, and in using it for the last seven months we have found it very satisfactory and now would not do without it.

You will notice in the camera here that it is made to work in a very limited space, and works well—the only added space taken is $\frac{1}{8}$ of an inch to the length to accommodate the pivot for the swing—this practically amounts to nothing. To

assure the plate being perpendicular after the swing is adjusted, this little plane you see on the side of the camera is used ; lines plainly drawn there will, due care being taken that the plate shall never lean backward out of perpendicular—a little lean forward may not be noticeable in the picture, and if a landscape with trees, it may add to its beauty.

A little about the origin of this swing may interest you. As some of you may remember, we were for some time waiting the advent of a camera that would suit all our uses for instantaneous work—it did not come, and we found the one to best suit our disabilities and the only left-handed camera in the market, to be the Anthony Climax Detective 4 x 5 Camera—we got it and soon learned that we must have a swing to do the work we wanted ; we needed the swing more and more, we found, as we developed each new lot of plates, and determined to have it, and we set to work thinking and tinkering it out ; we got in a short time a good single swing, and were happy until one day in the park we made an exposure on a certain bridge from a fixed position, we found the single swing was only about half what was needed—we could not get it sharp at one end with full opening of lens which was needed if we got it at all, as it was in winter and the light poor. We tried it repeatedly, a turn of the camera on its side making the swing a horizontal instead of vertical swing. This showed a way out of the corner we were in, and we immediately went to work to make the single swing a double swing, with the result you see here. Well, we got that bridge—sharp, too—from end to end.

The swing on the $3\frac{1}{4} \times 4\frac{1}{4}$ and the one on the 4 x 5 camera shown here, are for the same camera and the only ones made so far, and are only in the rough, having been made by us, assisted by our gunsmith ; we think that the swing will soon be in a shape that you may use it, and we wish it may give you the satisfaction it has given us.

We believe in swings and consider them necessary to secure good results under all conditions. It was this need of it that led to this, and the narrow limits in which it *had* to work determined its character.

After this swing was completed efforts were made to devise a swing that should be automatic and that would keep the plate in a vertical position without regard to the camera casing ; this was accomplished, but with an added weight to the camera of near 22 ounces ; this is a gravity swing and was used with the ordinary Anthony holders and glass plates ; with the new films and film-holders it is thought that 8 ounces added weight will be all that will be needed, and possibly much less will do ; this is thought not objectionable, but the other, of 22 ounces, was not to be thought of. We are not sure that an automatic swing is generally desirable ; surely, if used with our ordinary lenses, its limits must be restricted or wretched negatives will be produced more often than would be agreeable ; but it will come after a little, and we will see. A swing to give satisfactory results must be used with careful consideration for the work to be done, and the capabilities of the lens should be kept in mind when using it.

Raising fronts and swings are very desirable, and when we can use them on our cameras we had better have them, and carefully study their uses and use them when wanted.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

PYROCATECHIN OR ORTHODIHYDROXYBENZOL, $C_6H_4 \begin{Bmatrix} OH. \\ OH. \end{Bmatrix}$

(*Catechol-Oxyphenol-Oxyphenic acid-Pyrocatechinic acid.*)

BY P. C. DUCHOCHOIS.

PYROCATECHIN or orthodihydroxybenzol is a diatomic phenol isomeric with resorcinol (metadihydroxybenzol) and hydroquinone (paradihydroxybenzol). It may be prepared by the distillation of catechin, $C_{24}H_{20}O_9$, a substance little soluble in water, soluble in alcohol, ether, the alkalies and the alkaline carbonates, and possessing remarkable reducing properties which could be utilized in photography. The alkaline solution absorbs oxygen from the air, being colored yellow, then red, and finally black. Catechin precipitates ferric chloride dark green, cupric sulphate brown or black, and reduces to the metallic state the salts of silver, gold and platinum. It is extracted by macerating catechu for twenty-four hours, treating the residue with boiling water, which, in cooling, deposits crystals of catechin, and purifying the latter by successive crystallizations.

Pyrocatechin is obtained by dry distillation from catechu, cinchona bark, and generally from plants which contain a tannin forming a green precipitate with the ferric salts—caffeotannic acid, morintannic acid.* It is formed when phenol is fused with potassium hydrate, and when resins, such as benzoin, guaiacum, etc., are fused with caustic alkali. It occurs also when heating cane sugar, cellulose or starch with water at 200 to 280 degrees C. Buchner, who studied its properties, found it in pyroligneous acid (crude wood vinegar), from which it can be extracted economically by his process.†

Pyrocatechin crystallizes in colorless, transparent, rectangular prisms. It melts at 104 degrees C., and boils at 240 to 245 degrees C., evolving vapors which condense without alteration. Its taste is bitter, its smell that of butter, its reaction slightly acid. It dissolves in water, alcohol and ether. The aqueous solution turns green in the air by absorption of oxygen, then red in presence of the caustic alkalies and of ammonia. This distinguishes it from pyrogallol, which turns brown and finally black, and from hydroquinone, which becomes yellow under the same circumstances.

Pyrocatechin dyes fire-wood violet in presence of hydrochloric acid. Nitric acid transforms it into oxalic acid with evolution of red fumes. The ferrous salts have no action upon it, but those of ferricum produce in its solution an emerald coloration which passes to violet by the addition of sodic or ammoniac carbonate. Lead acetate produces a white precipitate, $C_6H_4O_2Pb$.

Pyrocatechin reduces the salts of the noble metals. Its use in photography, for the development of the latent image, was suggested by R. Wagner in 1859.‡ Lately Dr. J. M. Eder, by a series of experiments to ascertain its value as a developer in the gelatine process, found its action quite energetic, causing a reduction of a brown color, very non-actinic, consequently appropriate to transparencies, etc., and allowing to shorten somewhat the time of exposure. The formula of the compound recommended by Dr. Eder is given by Dr. H. Vogel in the BULLETIN for August 24th, p. 486.

Whether pyrocatechin, hydroquinone or any of the reducing agents suggested to replace pyrogallol will supersede it, is a question. No doubt they

* Liebig, Ann. Chim. Phys., XCII, p. 101.

† Jour. f. Pract. Chimie, LXXII, p. 164.

‡ Dingler's Polytechn. Jour., CXL, p. 375.

possess special properties which may be useful for certain purposes and in certain cases, such as the development of plates under-exposed, for which hydroquinone is excellent, for example; but for general use, the writer thinks that pyrogallol is still "the developer"; moreover, the chemicals in question require stronger alkaline solutions to exalt their reducing action, and this is often objectionable, as being a cause of frilling.

Pyrogallol can likewise be rendered more energetic by the hydrates of the alkali metals, as shown by Mr. Henry J. Newton, who, a few months ago, devised a compound which develops a picture perfect in the delicate details on gelatine plates instantaneously exposed.

DRY MATERIALS FOR THE DEVELOPER.

By E. W. ROCKWOOD, *Chemical Department Iowa State University.*

THE idea of keeping the components of the developer in the dry state until wanted for use is, of course, no new one, but perhaps the following method of putting it into practice may be new to many of your readers. I have never seen it published. It is one which I have used exclusively during the past summer on an extended tour in a climate where the atmospheric conditions and light were unfamiliar to me, and where, therefore, I desired to develop exposed plates on the spot. I determined to try the effect of carrying my chemicals dry and mixing them fresh by measure as I needed them, and have found it a success from the start. The measure that I used was one commonly employed for dry pyro, a wooden mustard spoon, cut down so as to hold two grains of pyro. The alkali was the carbonate of sodium. I ascertained by trial that the weight of the dry substance was very nearly five times that of the pyro, and found that the variations in the weight of the successive spoonfuls were trifling, being much too small to weigh by grain weights. The carbonate and sulphite of sodium, in order to obtain stable compounds, were dehydrated by exposing the crystals to the air in a dry and warm place until they had crumbled away to the fine white powder, losing about one-half their weight. A stock mixture was then made of equal proportions of each by weight, one spoonful of which corresponded to about 10 grains of each of the constituents in the crystallized state.

For development, one spoonful of the mixture and one of pyro were put into 1 ounce of water, where they dissolved very quickly, while the plate was soaking in water. As a precautionary measure I kept at hand a small vial of bromide solution, a drop or two of which was added to the developer. In doubtful cases or where over-timing was suspected only a part of the alkali was put in at first, more being used if required. By this means, and the use of the bromide, I found no difficulty in regulating the action as carefully as I could have done had I been using separate solutions. If extreme accuracy in measuring is desired the powders can be leveled off even with the top of the spoon with a knife blade or other flat object; but I have found this scarcely necessary. Carbonate of potassium cannot be employed in this manner on account of its absorption of moisture from the air. The proportions of the alkaline mixture can, of course, be varied to suit any particular formula. The advantages of this method are, the great cheapness of material, with ease of manipulation, and the non-liability to deterioration of the chemicals.

TESTING LENSES.

THE testing of photograph lenses formed the subject of a discussion at the meeting of the London and Provincial Photographic Association held last week. Only two of the members present—one of whom dealt rather with the optician's or manufacturer's ways of testing, whilst the other confined himself to the methods more available to photographers—spoke at any length, and it could not be expected that impromptu observations and suggestions, however useful in themselves, should be in any sense exhaustive; but the matter is, however, one of so much interest to photographers generally, that we propose to go into it with somewhat more detail than was practicable on the occasion referred to.

The several characteristic qualities for which it is customary and desirable to test a photographic lens are:

1st. Capacity for giving fine definition at the most advantageous position—that is, in the center of the field. This quality is principally dependent upon freedom from spherical aberration.

2d. Defining power towards the margin of the field, or, at all events, at some little distance from the center. This quality mainly depends upon freedom from astigmatism.

3d. The coincidence of the visual and chemical foci, or the working true to focus.

4th. Flatness of field, or rather approximate flatness; in proportion to the existence of which, objects at an equal distance from the lens, or any great distance from it, are in focus upon a flat plate without refocusing, whatever part of the plate they may fall upon.

Of these various points connected with the working of a lens, concerning which the photographer can satisfy himself, the one generally first noticed is that of working "true to focus"—that is to say, that the same part of the image which was focused on the ground glass shall come out sharpest on the plate. The term achromatic is commonly employed to designate lenses possessing this characteristic; but it is not a strictly correct one, for the following reason: Achromatic (without color) was the word chosen to describe lenses in which the various parts of the spectrum are brought so nearly to one focus that a point of light when seen in an optical instrument such as a telescope or opera-glass, shows without the fringe of color that accompanies such a point in the image given by a single lens of the kind used in the earlier telescopes, and still put into those of the cheapest kind. It is found, however, that for photographic uses it is necessary that the correction should not go so far as for optical purposes, and that, in fact, a lens that is achromatic—corrected, that is, as closely as possible for the eye—is what is called over-corrected for photography, so that the plate—which in the case of a simple uncorrected lens would have to be nearer the lens than the visually focused image—would in the case of a truly achromatic lens have to be racked a little further from the lens than the position of the focusing screen, in order to obtain the best definition.

The amount of correction, short of achromaticity, which is required for photographic purposes, being known, the manufacturer mounts the lens on what is called the optician's "horse," an instrument which corresponds to a long expanding camera without focusing screen, the image being examined by an eye-piece fixed at the back; and the lens is supported in a stand or frame in

which it is laid without the necessity for screwing it into a flange. The image used by the optician is what is called an artificial star, and is formed from the spot of light reflected from the globule of mercury contained in the bulb of a thermometer illuminated by a lamp. For a lens to be truly achromatic, the point of light thus obtained should appear without any fringe of color, whether in true focus or whether the lens is racked either within or without the focus. For photographic uses, however, there should appear in the image given by the lens a slight green fringe of color when out of focus in the one direction, and a corresponding fringe of a reddish purple tint when out of focus in the other direction. The practiced eye of the optician enables him to recognize the amount and character of these fringes that correspond to true correction—so far, that is, as concerns the obtaining of a sharp image in a photograph when the plate is in the same position as that which has been occupied by the focusing screen.

The method used by the photographer is different, and is by way of direct experiment in the camera. Provided that the dark slide and focusing screen are in true register, there is not much liability to error in the photographer's method; but this is a condition that must not be assumed as a matter of course—at all events, must not without careful measurement be so positively assumed as to justify the condemnation of a lens because it does not appear to work true to focus. Many a lens, as the optician knows to his vexation, has been complained of, and perhaps returned to him as not working true to focus, when the fault has in reality lain with the camera.

In order to eliminate, as they suppose, the possibility of error in the camera when testing lenses, some have made a point of focusing upon a piece of ground glass placed in the dark slide, so that it may occupy the identical position with that which is to be filled by the plate; but here again a mistake may be made. The pressure of the eye-piece (for a magnifier is almost always used in such trials) may be greater or less than that of the spring of the dark slide, and if there is the least "play" in the fitting of the dark slide in its grooves, there will be a difference of position due to the pressure of the eye-piece forcing it forward when focusing, which pressure is absent when the plate is being actually exposed in the camera. It is therefore of the first importance that the camera used for the purpose of testing lenses should be itself true and well fitting.

(To be continued.)

OUR ILLUSTRATION.

THE picture with which we illustrate this issue of the BULLETIN is from one of those wonderful negatives secured by Mr. H. W. Gridley, of New York, during his trip to the East. The subject is not a new one, but we have never seen a view of the Sphinx that could equal that obtained by Mr. Gridley in the matter of delicacy of detail. The picture also shows two of the Pyramids, which we do not remember to have seen in the same relative position in any other views of the same scene. Altogether the photo-gravure gives a new and very interesting reproduction of one of the most remarkable objects upon the earth's surface.

A UNIQUE specimen of advertising in Kansas City is in the shape of a large greyhound, on whose sides is stamped in plain letters, "The light running Domestic."

THE EXHIBIT OF APPARATUS AT BOSTON.

SECOND NOTICE.

THE M. A. Seed Dry Plate Company, St. Louis, Mo., exhibited their new Positive Films in all sizes, from cabinet to 20 x 24.

These beautiful prints were framed in all varieties.

Films mounted on a new and novel celluloid plaque created considerable attention. Photographs from negatives on Seed plates were shown from the following celebrated studios: Falk, New York; Ryder, Cleveland; Decker & Wilber, Cleveland; Gilbert & Bacon, Philadelphia; C. M. Gilbert, Philadelphia; Max Platz, Chicago; Hatton, Vincennes, Ind.; Mora, New York; E. Draper, Philadelphia; Emory, Rutland, Vt.; C. H. Gallup, Poughkeepsie, N. Y.; Holland, Champaign, Ill.; Brown, Albany, N. Y.; Morrison, Chicago; Sanford, Danbury, Ct.

One of the exhibits showing the greatest variety of work was that made by the Stanley Dry Plate Company. Most noticeable among the photographs comprising this exhibit were a series of 18 x 22 views, made by the Notman Photograph Company, illustrating the scenery of the Canadian Pacific Railway, in which the snow-clad peaks of the Rockies are brought out in perfect harmony with the green verdure and foliage of the valleys below. The Notman Company also showed a finely finished set of portraits of all sizes on these plates. Elmer Chickering, of Boston, exhibited a fine collection of 20 x 24 views and portraits, and the names of Ritz, Conly, Warren, Butterfield and Hastings were also noticed, the work of Mr. Hastings including the portraits of the class of '89 of Dartmouth College.

One of the most novel features of the exhibit is a group of four flash-light photographs of opera troupes, taken in action on the stage by Burrell, of Providence.

The central wall of the Stanley Plate Company's exhibit was filled with a collection of instantaneous and marine views, made by Mr. Peabody with the Wray single landscape lens. Among the most striking of these were several views of vessels taken in the rain during a heavy storm, from the deck of a rapidly moving steam-tug. This would be a remarkable feat for the most rapid double lens to accomplish, but still more wonderful does it appear when considered as the work of a single combination. This lens, which has recently been introduced by Mr. Wray, of London, works with an aperture of $f/8$.

The New Eagle Dry Plate was also well represented. The following prominent photographers are using this dry plate, and contributed work for the Boston Convention: Tabor, Thors, San Francisco; Stein, Milwaukee, Wis.; Clark, D. R., Chicago; Heale & Co., Horton Bros., Rose, Providence, R. I.; J. Waldon Smith, George H. Hastings, Holland, Boston; Sarony, New York; Doerr, Louisville, Ky.; Guerin, Julies Strauss, St. Louis; D. P. Thomson, Kansas City; Gutekunst, Philadelphia; Boston Photo-engraving Company (using strip plates); Alman, New York; Dabbs, Pittsburgh, Pa.; Johnson, New York; Entekin & Co., Philadelphia; Rothengatter & Dillon (Flash Light), Philadelphia, and others.

The Harvard dry plate was started two years since, by George L. Damon and John D. Record. It has had phenomenal success, considering the time it has been on the market. The Company are pushed to their fullest capacity to fill orders. Displays were seen from Bogardus' studio, of New York; Ritz, of

Boston ; Lloyd and Magill, of Troy ; Butterfield, of Cambridge, and others. The Company was represented by Charles S. Nash.

The exhibit of the A. M. Collins Manufacturing Company was by far the most elegant and tasteful yet made by this great house. On four right angle frames of solid antique oak with German silver mountings hung thousands of cards of every conceivable size, color and style of edges, some lithographed with beautiful designs in inks and bronzes of many hues, some embossed in various styles, and others stamped in pure gold. Under the frames and extending around the five hundred feet of space was laid a rich carpet, and in the center a beautiful and costly Persian rug of rich design. On the rug stood a massive oaken table exquisitely carved, and three antique chairs to match the table. The observer could not help but be impressed with the immensity of the lines shown and the importance of the existence of this house to the photographic trade. A prominent photographer remarked to the writer, "If the A. M. Collins Company should suddenly stop business it would paralyze the photographic trade; all the mills of England, France and Germany could not supply the demand." Few people realize the vast extent of the business transacted by this house and the huge capital invested, giving employment to hundreds of people in their great mills and warehouses in the City of Brotherly Love. Close and intelligent attention to business and sterling integrity in the conduct of its affairs for forty years has made this house the greatest in the world and its name known to every civilized nation on the face of the globe. To the good taste of the gentlemanly and genial Mr. Janes we owe the arrangement of this beautiful exhibit, and we feel sure that all who saw it will feel grateful for the opportunity.

The Bausch & Lomb Optical Company, of Rochester, N. Y., exhibited their Rapid Universal Photographic lenses and diaphragm shutter, and also a new construction of photographic lens, the invention of Mr. Alvan G. Clark, the celebrated manufacturer of telescopes. These lenses are of a construction dissimilar from anything heretofore followed. While these lenses are of the ordinary Rapid Rectilinear type, they are really wide angle, embracing an angle of about 100 degrees, but are dissimilar from other lenses of this character in so far that they work with full aperture. They are almost free from spherical aberration and cover their respective plates better than any lenses yet produced specially for this work. The lenses are uncemented, each lens of the combination being mounted for itself, and are therefore free from danger of gradual decrease in speed, so common in many lenses owing to the chemical change in the cement. The crown glass is on the outside, and therefore less liable to become scratched. While these lenses are intended to be used in all out-door work, they are also particularly suited to copying, enlarging and photo-engraving work, and are superb for portraiture, particularly for groups. They all work with stop $f/7.5$, and are therefore adapted to all work requiring speed. Besides the lenses and shutter, there were on exhibition in two large frames photographs, portraits as well as landscape views, which were largely admired, and which show the good qualities of their Universal lens. Two 40 x 50 bromide enlargements from a 4 x 5 negative were beyond question good proof of the definition of their lenses.

THE GUNDLACH OPTICAL Co. had a fine display of lenses which attracted much attention. The Company now lists over sixty sizes and styles of lenses, and photographers can find lenses of their make adapted to any work for which they may be wanted. One of the novelties which was shown is the new "Rapid

Single" lens, which is a single triplet combination, of great optical excellence, and is made of glass from the celebrated Jena factory. Members in attendance were presented with a beautiful souvenir, consisting of work in photo-gravure by Gundlach lenses.

In the exhibit of Morris Earle & Co., Philadelphia, sole American agents for R. & J. Beck, Mr. Earle had the new series of Extra Rapid Portrait Rectilinear lenses fitted with Iris diaphragms; this type of lens combines the qualities of a portrait lens with those of a rectilinear having twice the opening of the regular rectilinear, and consequently requiring but one-fourth the exposure. A combination Beck lens of 5, 7 and 9 inches focus, with an Iris diaphragm, suited by their scales for each lens, one cap and one flange. Wide angle lenses with Iris diaphragms. A stereoscopic camera with a detective box covering, containing one pair of 5-inch autograph lenses with Iris diaphragms controlled by one lever and one Newman shutter. A Regular Detective Camera, $3\frac{1}{4} \times 4\frac{1}{4}$, with six double-plate holders; the inside of the box arranged so that the bellows part is used as a storage box for plate holders. A new Autograph Finder, very unique and suitable for any kind of a camera—being very quickly adjusted. The New Pine Flash-Lamp and Redding's Pocket Lantern were greatly admired.

Lack of space prevents us from calling attention to a number of other interesting exhibits. These will appear in our next.

AN ERROR AT BOSTON.

To the Editors of the BULLETIN :

We see by the last number of the BULLETIN that you credit Mr. E. Decker with the award of the "Eastman Cup" at the Boston Convention. The cup was awarded to our firm by two of the three judges appointed for that purpose. The judges were Mr. Glines, of Boston; Mr. M. L. Hatton, Vincennes, Ind., and Mr. John Bartlett, Philadelphia. The last two mentioned voted our exhibit the best, and were much astonished and indignant when they heard of Mr. Decker having been given the prize.

An investigation started by Mr. John Bartlett, Mr. W. Stuber and others, disclosed the fact that Mr. Bartlett's vote, which he himself had handed to Secretary O. P. Scott, had been thrown out, and a vote handed in by Mr. Dixon, of Toronto (who had no right whatever to vote), substituted. We don't know that we are justified in saying "substituted," but anyhow, Mr. Dixon put in a vote and it was counted, and the vote handed to Mr. Scott by Mr. Bartlett was not counted. Call it whatever you think right.

The injustice done our firm was called to the attention of the officers of the Association on the evening of the day the awards were announced, and we are informed that they positively declined taking any steps toward rectifying the "error." We shall demand of the Photographers' Association of America that the records of the Convention be changed, and the award made by its properly accredited judges given to our firm as intended by them.

We wish you would kindly give the above matter publicity. If you think necessary, we will forward to you letters from Mr. M. L. Hatton and Mr. John Bartlett, stating how they voted.

Yours very respectfully,

ROTHENGATTER & DILLON.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

THE CHICAGO CAMERA CLUB.

THE members of the Chicago Camera Club enjoyed a very successful outing September 7th. A special car on the Chicago, Burlington and Quincy Railway took the party to Riverside, a suburb of Chicago, and the day was spent in viewing on the picturesque Desplaines River and Salt Creek. The car was side-tracked conveniently, and at noon a delicious lunch was served on board. The day was perfect and many beautiful pictures were made. Considerable interest is felt in the contest for the Club medal, which is to be awarded for the best picture made at the outing.

The regular monthly meeting of the Club occurred September 13th, and the announcement of the demonstration of the new developer, eikonogen, called out a gathering which crowded the rooms. After the regular business had been transacted, the Club's chemists and experimenters were called upon to relate their experiences, and as the Club's importation of eikonogen was one of the first in the county, great interest was manifested. Drs. Nicol and Garri-

son, and Professors Bartlett, Harley and Colegrove, briefly detailed the results of their investigations, all of which seemed to be favorable, and in several cases highly laudatory of the new developing agent. Dr. Nicol, for instance, had developed two plates, exposed under exactly similar circumstances, one in pyro and the other in eikonogen, and had obtained a much finer negative from the eikonogen in two minutes, while the one in pyro took fifteen minutes to develop—or, as he expressed it, the one in eikonogen was developed, fixed and washing before the detail was fully out with the pyro example. At the conclusion several lantern slides were shown upon the screen which had been developed with eikonogen and hydroquinone for the purpose of comparison. The results were nearly identical, though the eikonogen gave rather softer and warmer tones.

FRED. K. MORRILL, *Secretary.*

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

Third Session, 8.30 P.M.

BOSTON, August 7, 1889.

(Continued.)

A Member—Do I understand you to speak of placing the sensitive plate inside the visual focus, near to the lens?

Mr. CLARK—Yes, sir.

A Member—Will that give sharper results?

Mr. CLARK—That is the theory of the thing. It will not with all lenses. But they should be corrected so as to give that result. It would be a great deal better to put it inside.

A Member—I did not know but you said it would increase the sharpness with any lens?

Mr. CLARK—No.

Mr. RANGER—Do you mean that the chemical focus works better by being inside the other lens?

Mr. CLARK—Yes, sir; the color is so corrected that you get your best visual focus by setting it inside. It is more under-corrected than the ordinary photographic lens.

Mr. RANGER—Then the way that you employ it in astronomical photography is, to have the chemical focus inside the visual?

Mr. CLARK—Yes, sir; we get at the focus by trial.

A Member—Do you mean that the lens that is under-corrected for a chemical focus is likely to be a better lens than as though it were corrected?

Mr. CLARK—No, I do not mean that. I do not think you put the question exactly right.

The same *Member*—Perhaps not. Some years ago I had occasion to use an old Harsinson lens in which the visual and chemical focuses were different. It gave a very much better result than another one of the same size that was not corrected.

Mr. CLARK—Then your glass was inside the visual focus, was it not?

The same *Member*—Yes.

Mr. CLARK—It must have been.

Mr. RANGER—I have had some experience, and have had cases where I think the difference between the visual and chemical focus would be at least one-sixteenth of an inch, perhaps nearly one-eighth.

Mr. CLARK—What is the focus of your lens?

Mr. RANGER—I do not remember. Perhaps 8 to 10 inches. A lens of that kind will give a better image than you could get where the visual and chemical focuses were corrected.

Mr. CLARK—Could you tell whether the plate was outside or inside the focus?

Mr. RANGER—Inside.

Mr. CLARK—I think you will find that so always. If I were to go into the market to buy one, I would take one where they did not agree.

Mr. RANGER—I have thought many times whether lenses would not be better in that way, or whether some of the power of the lens was not lost by making corrections as they are now demanded where the chemical and visual foci are in the same plane.

Mr. CLARK—If I had a blackboard I could illustrate that better.

Mr. CARBUTT—Many years ago I had a Voigtlander lens. With that, the lens was turned in according to the size of the image. If you are making a very large image on ground glass, you have to turn more than you would if you were making a smaller image on ground glass.

Mr. CLARK—I have heard of that before, but I have never seen one. Mr. Lewis M. Rutherford, of New York, has done a great deal of very nice astronomical photography, and he has photographed other things a good deal. He told me at one time that when he had done the best he could to correct his glass for visual purposes he put on a third lens of flint glass, and he had to shorten the focus about one-tenth. That made it, of course, what we would call very much under-corrected, and I think he was the first man—I am sure he was the first man—that made a third lens for pho-

tographing. Then I asked of him how it was with the ordinary photographic lens. He said he had tested them thoroughly, and he said it was just half way between. But these new plates, the dry plates, work rather into the blue and up into the green than the wet plates did. So the visual and chemical foci come nearer to coinciding than with the wet ones, if I understand. Do you know, Mr. Carbutt?

Mr. CARBUTT—I do not think they do, on account of the thickness of the film. They may on account of the chemical composition.

Mr. CLARK—That is what I mean. It is moved right along in the spectrum. With the collodion plate, it is very difficult to get any action at all beyond the blue. They do with these dry plates.

Mr. CARBUTT—Will Mr. Clark please explain to the members here the difference between the visual and chemical focus in his telescope at Lick Observatory, for taking photographs of the moon?

Mr. CLARK—He has asked me a question that I cannot answer, because I never tried the instrument with the photographic lens on as a visual telescope. I do not know where the focus would come as a visual telescope. All I can say is that it would fall outside. But we had to shorten the focus up on that telescope, from the visual telescope, well, between 5 and 6 feet. But then that was done with a third lens.

Mr. CARBUTT—That is what I had reference to.

Mr. RANGER—What was the length?

Mr. CLARK—Fifty feet for the photographic and 56 for the visual. Diameter of the lens, 36 inches.

Dr. ELLIOTT—While we are talking about the subject of lenses, I would like to ask Mr. Clark what the influence of the new Jena glass will be?

Mr. CLARK—That is another question that I cannot answer. There is no doubt but that this man Schott—I cannot pronounce his name; I always call it shot-gun, it looks so much like it—there is no doubt that he has produced some glasses of crown and flint that give a correction that has a rationality, reducing the secondary spectrum enormously. I have no doubt that in a photographic lens made of that glass the visual and working foci would agree nicely. But what I have seen of it personally has not been of good material. I could not use it. I hope they may turn out something in large discs good enough for our astronomical telescopes, but I have never seen

any as yet. I have read with a good deal of interest the paper that Dr. Hastings has written on the subject. But some of them tell me that this glass is perishable. It does not do for us to make a large glass of a material that is perishable.

Mr. PICKERELL.—While we are on the subject of lenses, I wish to give a little of my experience. I have handled lenses a good deal. And I have heard a good deal of talk, in the course of my travels over the country, about the visual and chemical focus of a lens. If Mr. Hyatt was in the house, I would make reference to one case. A man had an instrument in which he said the visual and chemical focus lacked one-sixteenth of an inch of being together. They wrote Mr. Hyatt, I believe, and he replied that if that instrument could not be worked they might return it, but that "Old Pick" was coming up there, and he would see what the matter was. I went up and found that he was focusing on the subject. Then he had a tube marked off, and he was running back one-sixteenth of an inch, and from that standpoint he took his picture and got in sharp. I said, "That is a funny proceeding for a man of your experience." I laid down a tablet. Sighted the straight edge across the face of it and then cut a piece of paper and slipped it under the straight edge, and marked it. I then took the ground glass, threw the edge across it and marked the same as with the plate. And we found that the object glass stood nearer the rear lens by one-sixteenth of an inch. There is where he made his mistake in his visual and chemical focus. I raised the object glass the thickness of extra No. 1 cardboard and made an impression, giving it exactly half the distance that he had marked on the tube, and the result was good. Several months after that, I met with a man in the same condition. He says, "This is of no account; the chemical and visual focus are not in harmony." I said, "Sir, I will fix that tube." I took two or three bottles of cyanide of potassium and set them on a table, one here, one there, and the other there. I made my focus on the center bottle, and the image came out sharp on the rear bottle. Then it became necessary to adjust the ground glass just as I had done before. And the result was good. Again, I have had in my experience over fifty tubes sent me in which they claimed the chemical and visual focus was not correct. I say, "I will not attend to this business unless you send me the box on which you worked the tube." Then comes the box. I find the same old trouble. They

are not adjusted properly. There is a difference between the ground glass and the tablets, and this is the correction of the visual and chemical focus. Now, to illustrate again: I have been in this business since 1850. A gentleman came into my room one day with a C. C. Harrison instrument. He said, "This affair used to work well, but now I cannot do anything with it." I say, "What is the matter with it?" He replies, "I don't know, I guess it has lost its temper." I say, "Well, that is a funny thing." I saw in an instant that he had his rear lens turned right around. Said I, "What will you take for this?" He said, "Eight dollars." I said, "In money or goods?" He replied, "Two dollars in money and six dollars in goods." I said, "I will take it." I opened up the rear lens and I found that he had the thin lens on top of the thick lens. I turned it around and sold it for forty dollars before Saturday night. Of course I ought to have given him something back, but I didn't. (Laughter.) Now, taking the rear lens, there are a great many working under that same disadvantage. I went into a place where a man was working, and he was using stops of about that size (closing thumb and forefinger), and setting fifteen seconds on a rapid Cramer plate. I said, "What does this mean?" He said, "I cannot do it in any other way." He said, "This has been sitting under the skylight for eight years, off and on, and it has lost its temper." I said, "Do you think the tube has lost its temper or that you have lost yours?" The fault was exactly the same. He had his lens turned around. Now for Mr. Hyatt again. When the gem tubes were in use he sold four gem tubes on a brass plate to a man. The man informed him that he couldn't get anything like a picture out of these four gem tubes. Mr. Hyatt replied to him, "Pickerell will be there, and he will fix it all up." I went down. What did I find? Here is this tin box, and he had it run out this way. Here is the front of the box (indicating), and the tubes were away down here. He had it turned wrong side in. I tore up his old tin box. You ought to have heard him laugh. I took his old tin box and threw it away and put a tin plate on a board and stuck it in and made an impression. He said, "Pickerell, don't tell Hyatt of that for the world." That is just the way the thing goes. And if you boys ever get hold of a camera box in which your visual focus and your chemical focus do not work properly, just send it to me, and if I do not fix it for you, I will throw up the sponge.

(Laughter and applause.) There are lots of things I would like to talk about, but I don't want to be too conspicuous here. I want to give room to somebody else. Just be a little careful when you are fixing your camera box.

Mr. MILBURN—I wish to announce that we would like to have you all attend a demonstration to-morrow evening, at eight o'clock, of this transparent film. We wish you to see the practical working of it. We will be glad to have you all come.

The *President*—To-morrow evening we will have some more papers and some discussion. If there is nothing more this evening, we will consider the meeting closed.

Fourth Session.

BOSTON, August 8, 1889, 11 A.M.

President McMICHAEL—Before beginning our business, Mr. Hastings will distribute some envelopes through the audience for the purpose of allowing each of you to contribute a dollar towards the Daguerre fund. (Envelopes distributed.) The first order of business this morning will be the reading of communications.

August 6, 1889.

Gentlemen of the Convention.—The Boston and New England photographers cordially invite you to attend the reception and harbor excursion that occurs on Saturday next, 10th inst. The magnificent steamer "New York" has been specially chartered, and leaves Battery wharf at 9.30 A.M. A trip, passing all of the most noted points of interest, has been arranged. Dinner and other refreshments will be served on board the steamer. No expense whatever is attached to this trip, and it is our earnest wish that as many as possible, with their wives included, shall accompany us and have a pleasant trip. Please make application to the President of the Convention at once for tickets, in order that the reception Committee may know for how many to provide meals, etc.

Fraternally yours,

J. WILTON HALL,
G. WALDEN SMITH,
JOHN STALKER,
WM. H. PARTRIDGE,
C. F. CONLY,
W. A. FRENCH,
W. A. WEBSTER,

Reception Committee.

The motion was then carried that on behalf of the kindness of the photographers of Bos-

ton in extending an invitation to this beautiful trip, the unanimous thanks of the whole fraternity be tendered.

The following communication was read.

CINCINNATI, O., August 7, 1889.

H. McMICHAEL,

President Photographers'

Association of America,

Mechanics' Hall.

I congratulate you all on our half century birthday, regretting that I cannot join in the feast. I am always with you in heart.

Fraternally, J. LANDY.

The *Secretary*—We have the Anthony Bromide Paper Awards. I will read them.

Award of prizes on pictures made on Anthony's Reliable Bromide Paper.

"We have decided to award the prize for plain enlargements to the exhibit marked with a star, and the prize for worked enlargements to the exhibit marked Vindex.

F. W. GUERIN,

JOHN BARTLETT,

C. H. DAVIS,

Judges."

Star exhibit by A. A. KNOX, New York.

Vindex, by G. H. CROUGHTON, Rochester.

The *President*—Unfinished business is now in order.

Mr. CLINE (of Boston)—I would like to repeat my motion of yesterday, which was out of order, that the Association appropriate the sum of \$1,000 towards a Daguerre testimonial or monument. There are \$3,000 surplus, I understand, in the treasury. I do not think we could put a part of it to any better use. (Motion seconded.)

Dr. ELLIOTT—I have no wish to object to any appropriation of money of that kind. But I think we want a popular movement in this, in which the small will feel as big as the large man, in which a man who has got only a hundred dollars will feel just as good as if he had a thousand. I move that every man put one dollar in and no more. (Applause, and a voice, "That is right.")

Mr. CLINE—I did not intend to shut off those men that want to pay a dollar. I am willing to do that myself. But I wish to give the thing a national significance. It would look as if we had thought something of the matter. And, this being a semi-centennial celebration of the discovery of photography by Daguerre, I thought it was proper that this Association should contribute as an Association, and then subscriptions could be taken afterward.

Mr. CARBUTT—I think, to make this matter popular and national, every man should feel that his contribution is needed and should consider it a privilege to subscribe. I think if the Executive Committee of the Association would issue a circular to all the photographers of the country, asking their contributions to this general fund, it would be a very excellent thing. (Applause.)

A Member—Will you put that as a motion?

Mr. CARBUTT—I offer that as a substitute motion for the previous one.

A Member—Offer it as an amendment.

Mr. CARBUTT—I do not feel that it ought to be offered as an amendment. I think the Association itself should do something, and that the photographers of the country ought to have the privilege also. I think this monument should be something that we can all point to in coming ages as coming from an association of very liberal representation in this country. I think, now that we have a surplus in the treasury, a reasonable amount—I am not in favor of \$1,000—but I think that probably \$500 might be appropriated from the treasury and come in at the last end, and that the photographers of the country be allowed the privilege of contributing their one dollar each. I think a very handsome subscription could be raised, if circulars were sent by the Executive Committee of the National Photographers' Association.

Mr. CLINE—I would accept that amendment of \$500 if that would help the matter along.

Mr. RANGER—I think it is bad policy for us, at the beginning of this movement, to appropriate money from this treasury for the monument. I think it is better to get our subscriptions first. That will take some time. Then, if it is necessary to have a little supplement, it will be proper to appropriate a sum of money from the treasury of this Association.

Mr. CARBUTT—I will offer this amendment, that a circular be issued to the photographers of the United States by the Executive Committee of the National Photographers' Association, asking them to contribute one dollar each, and that the contribution from the treasury of the National Photographers' Association be postponed until our next annual meeting.

Dr. ELLIOTT here withdrew his amendment.

Mr. CRAMER—I am very glad to see this motion before the house. I think that all the members of our profession ought to hold

Daguerre in high honor. There is nothing more proper than that our Association should do something to honor him. And it is a good idea to give a large number of our fraternity a chance to contribute. And it will be better to attend to that first. That will take at least a year. And there will be others that will certainly be ready to contribute if the fund should not be sufficient.

The *President*—You have heard the motion as stated by Mr. Carbutt. Are you ready for the question? (Motion carried.)

Mr. BURBANK—I would like to ask if contributions to the Daguerre fund will be acceptable from the amateur photographers of the country?

The *President*—I presume they are acceptable from anybody.

Mr. RYDER—As the maker of the original motion, I have in view that this should be opened to everybody, to the amateur, to the admirer of the art, to everybody who is interested in the art and in its discovery. I should not consider it good policy to debar anybody who is willing to contribute.

Mr. BURBANK—I would like to make the motion that the different photographic journals of America be requested to open subscriptions in behalf of the Daguerre fund. (Motion seconded.)

The *President*—That was included in the motion yesterday.

Mr. CARBUTT—I would like to express a few ideas in regard to this memorial to Daguerre. While we are all deeply indebted to him, there are two other persons by whose researches and their results we have made more money than by those of Daguerre. It may be too late to make any amendment, but I think a medallion of three profiles, embodying the portraits of Daguerre, Scott Archer and Dr. Maddox, would be appropriate. The trouble would be, there are so many investigators that have done so much for us that if you once commence you do not know where to stop. I was on a committee for the Franklin Institute of Philadelphia to award the Scott medal for the air brush. I was also on a committee to present a medal to the one giving us the best improvements on a substitute for collodion. And it fell to Dr. Maddox. We thought there were several names equally entitled to recognition. But we found that if we went into it we wouldn't know where to stop, and I think those three names should be forever held in respect for what they have done for us; Daguerre, the discoverer of photography, Scott Archer, the inventor of collodion,

and Dr. Maddox, of London, Eng., of the gelatine process, which has now superseded the previous ones.

Mr. GENTILÉ—I think it may be well to state a fact in connection with this matter. Many American photographers have already contributed to a monument to Daguerre. I do not say this with any desire to make any criticism, because this is to be erected in America. But a number have contributed to a monument that is erected now at the birth-place of Daguerre in France.

A large number of us subscribed to it. I have no doubt that many who are present here subscribed to the fund for that monument.

Mr. RYDER—My idea in starting this movement was, to erect a monument to the discoverer, the original discoverer of photography. There are many men to whom we owe for more recent discoveries, but my idea pointed to the original one. I feel a conviction that we had better not embody too much. These others we can remember at another time. I think that we may be detracting from the main object a little in taking any one else into it. That is my idea. (Applause.)

Dr. ELLIOTT—I am still thinking of the location of this monument. I had that thought yesterday, and I have it still to-day; I cannot get it out of my mind. I want to make a suggestion about the location of this monument. My idea is, to put the monument in the Smithsonian Institute in Washington. That is a representative institution of the inventions of this country and I think it will be a good place for this monument. It is at the National Capital, and it is not in any State. (Applause.) I make that as a suggestion only. I think it is a good plan to settle the matter now, and thus leave the Executive Committee without the embarrassment of the question as to where it shall be put. I can assure you from having been put on committees of this kind that it is a very difficult matter to settle. I have found it so many times, and those of you who have served on committees of this character will understand the difficulty of the question coming up, as to what we shall do with it. If we put it in one place, it will excite the jealousy of the people of another place. Washington is not in any State in the Union. It is the Capital of the country. And the Smithsonian Institute is a representative institution of the inventions and genius of this country, containing everything of interest in respect to inventions and science. I think that would be a good place for it. I simply throw this out as a suggestion.

A Member—Make it as a motion.

Mr. RYDER—I suggest that if that is offered as a motion I would be most happy to second it.

Dr. ELLIOTT—I make it as a motion.

(Motion seconded and unanimously carried.)

The *President*—Is there any more new business to come before the Association?

Mr. MAX HEIN—I would like to call the attention of the Convention to the proposed world's fair in 1892. I think the Association should take immediate steps to be represented on the New York Committee. I know that it is two or three years off, but it takes some time to make the preparations, and I guess this is a proper time now to speak of it.

Dr. ELLIOTT—In connection with that, I would like to say that the Mayor of New York has extended an invitation to all arts and sciences to have their representatives present. I think the idea is an excellent one, and that we should nominate a delegate and submit his name to the Mayor of New York to put upon this committee. There will be a committee representing photography, and I think it is an excellent idea to have this Association represented as the National Association of America.

Mr. GENTILÉ—If you are going to nominate one for the New York committee I shall request that you nominate for the Chicago committee. (Laughter and applause.) We do not propose to be left in the cold in the matter of this great exhibition for 1892. (Great laughter and applause.)

Mr. GUERIN—We have decided to have that world's exposition at St. Louis. (Great laughter and applause.)

Dr. ELLIOTT—I think the gentlemen fail to understand what exhibition I refer to. I refer to the exposition to be held in 1892, not to the Photographers' Exhibition.

Mr. GENTILÉ—Oh, no; to the World's Exposition, of course.

Dr. ELLIOTT—In New York?

Mr. GENTILÉ—But we have started to raise the money in Chicago already.

Mr. DECKER—I think the suggestion of Dr. Elliott is an excellent one. We should have a photographer in New York to represent the Association, and I move that Mr. Rockwood, of New York, be suggested to the Mayor of that city as a member of the committee from the Photographers' Association of America. Mr. Rockwood, of New York, is a very active man and one who would take a great interest in this matter.

A Member—Is Mr. Rockwood a member of this Association?

The *President*—I could not say. He attended the meetings of the Association last year.

Mr. RANGER—I move, as a substitute, that Dr. Elliott be our representative.
(Motion seconded.)

Mr. DECKER—I think we had a letter written from Mr. Rockwood yesterday to this Convention. I think he is now in Europe. But at the same time I will accept Dr. Elliott's name as a substitute for my nomination on that committee. I think he would be a very excellent representative in every respect. (Cries of "Hear, hear.")

Dr. ELLIOTT—Unfortunately, I am not a photographer, and therefore it would be rather out of place to put me in that position. I am only a litterateur and journalist. I am not a practical photographer. You would not want a man who is not a good photographer. I do not see any objection to Mr. Rockwood, if he is not a member. I think he would have been here and been a member if he had been in the country. I have no doubt he would have been here, and it would have been very interesting to have him here. He is a good, live man. I do not think that the fact that he has not paid his subscription this year makes any difference.

Mr. HEIN—I guess the proper way will be for a committee of perhaps five men, such gentlemen as Dr. Elliott and perhaps Mr. Rockwood, and these five should appoint another man for a representative in the committee. These five could assist the representative in all matters of interest to the Association.

Mr. GUERIN—I want to know what is the matter with Bogardus? (Great applause.) He is all right. (Great applause and laughter.)

The *President*—Do you make that a motion?

Mr. GUERIN—I make that a motion.

The *President*—It has been moved and seconded that Dr. Elliott be a delegate to the World's Fair in 1892, representing the Photographers' Association of America.

(Motion carried.)

Dr. ELLIOTT—Gentlemen, I have to thank you for the honor you have conferred upon me. I will do the best I can, but I wish somebody else would come in and help me. What is the objection to having two or three?

A Voice—None.

A motion was then carried that the committee be extended to five.

Dr. ELLIOTT—Now, gentlemen, the question comes, how is the committee to be appointed? I move you that the President of this Association appoint the members of that committee.

The *President*—I will make the report on this to-morrow morning.

Mr. GENTILÉ—You all seem to take it for granted that New York has got the Exposition. There has nothing been settled about it yet.

A Member—They are going to have it.

Another *Member*—I believe it was not stated in the motion where it was to be held.

The *President*—No. It doesn't make any difference where it is to be held. Is there any more new business before the house?

Mr. GENTILÉ—We have among us the officers of a new association, an association that proposes to bestow a great benefit upon the photographic fraternity. They undertake to tackle a question that this Association has not been able to touch. I think it would be appropriate to call on their representative men to give us some enlightenment. I think it is a matter that would interest us all. We have already taken a deep interest in it. I think it would be a pity to allow this Convention to go by without calling upon these gentlemen to express their views in the matter. Therefore, I make a motion that we call on Mr. Bogardus, the President of that association. (Motion carried.)

Mr. Bogardus spoke (See page 498), after which Judge Cady addressed the meeting. (See page 502.)

Mr. BOGARDUS—May I say a word? We have with us here some of the old relics. I am a young man myself, but we have one gentleman here who commenced making daguerreotypes in 1841. We have two, as I understand, who commenced in 1842. I commenced in 1846. You see now where the "young man" comes in. I would like, if possible, to have you take fifteen or twenty minutes some day, and have all these old gentlemen get up on the platform there and say a few words. I think the whole Association will be glad to hear from them.

The *President*—To-morrow morning these gentlemen will please come upon the stand so we can see who they are. If there is nothing more under the head of new business, we will proceed to the election of officers for the ensuing year.

Mr. RYDER—I came to Boston to attend this Convention. I came here to see my old friends and to attend this Convention. And being nominated or elected to any office was no part of my business here. I have, unsolicited, and unknown to myself, been put upon the ticket for an honorable office. I feel honored and complimented, but I beg you all to excuse me.

I withdraw my name and leave it to some of the younger men.

Mr. GENTILÉ—We have among us a gentleman whom we ought to honor, one of the veteran stock dealers of the United States, Mr. Benjamin French. I think we ought to honor him by inviting him on the platform.

(Mr. French was invited upon the platform, where his appearance was greeted with great applause.)

Mr. FRENCH—*Ladies and Gentlemen*,—I am quite hoarse to-day, and I do not know as I can be heard. But I thank you very much for the compliment, and as I am so hoarse and not able to speak, I will ask to be excused. Thank you very kindly. (Great applause.)

The *President*—Nominations for President are in order.

Mr. STUBER—(of Louisville, Ky.)—I nominate O. P. Scott, of Chicago, the young photographer, as President.

Mr. PICKERILL—Could I make a few remarks upon that nomination? I only want about two minutes. I have been in this business all my life. My friends and my acquaintances are among photographers. I used to think I had a good many friends, and I believe I have yet, among the stock dealers. Sometimes they turn the cold shoulder towards me because I have done business directly with you. I have the greatest regard for every man in the profession. And, as has been stated upon the rostrum, I am in favor of the elevation of this glorious business of ours. I started out in 1850. I have been associated with photography ever since. Nine years ago I became acquainted with this Mr. Scott. I do not think he is the only man competent to be the President of this Association for the ensuing year. But I claim he is competent among the rest. There are other candidates coming up that are friends and that are good workers. But here is a young man who has attended every Association meeting since 1880. He has contributed his mite, he has taken medals, and in the West he carries a power with him. This is the kind of a man that you have placed in nomination for President.

Gentlemen and fellow citizens and ladies (laughter), I thank you for the notice you have given me, and I trust when the time comes when this great institution of ours has soared up as to that queen of night, and when the broad flashes of lightning have gathered on the dry plate—(the remainder of the sentence was lost in a storm of laughter, applause and stamping of feet).

Mr. RANGER—Mr. President, I feel a little bit small after the gentleman who has preceded me. I wish to take the remarks which he has made and applied to the gentleman that has been placed in nomination; and, with equal force, apply them to a name which I shall present to this Convention. I nominate Mr. J. M. Appleton, formerly of Dayton, O.

Mr. RYDER—I feel honored in that, as well. I am here to vouch for Mr. Appleton as a man well suited to the position, and I ask all those who would naturally have given their strength to me, to devote it to Mr. Appleton.

Mr. CRAMER—I move you that the nominations be closed. (Motion seconded and carried.)

(Messrs. Guerin, of St. Louis; Dixon, of Toronto, and Motes, of Atlanta, Ga., were appointed tellers.)

A suggestion was then made that both candidates sit upon the platform, but it was ascertained that Mr. Appleton was not in the hall. (Motion to adjourn was made by Mr. Ranger.)

The *President*—The ballot stands: Mr. Appleton, 115; Mr. Scott, 69; Mr. Hastings, 4. You have elected Mr. Appleton as your next President. (Applause.)

Dr. ELLIOTT—I move that we make the election unanimous. (Motion seconded and carried.)

The *President*—Will Mr. Ranger and Mr. Gentilé bring Mr. Appleton to the hall?

Mr. CARBUTT—Isn't the election of the other officers in order?

The *President*—There is a motion for adjournment until to-morrow morning.

A motion by Mr. Carbutt, that the election of the First Vice-President take place immediately, was declared out of order.

Mr. Appleton was then brought upon the stage by the committee appointed to escort him.

The *President*—Mr. Appleton, the Photographers' Association of America have elected you for their next President. Do you accept the office?

Mr. APPLETON—I do. *Mr. President, Ladies and Gentlemen of the Convention*,—I cannot at this time express the appreciation that I have of this honor which you have conferred upon me. But I will endeavor to demonstrate it to you by my services. (Applause.)

The Convention was then adjourned, to hold its next business meeting at 10 A.M., Friday, August 9, 1889.

Fifth Session—Evening.

BOSTON, August 8, 1889.

This meeting was devoted to the reading of the papers of Messrs. G. Hanmer Coughton (see page 536) and M. E. Ames (see page 521), both of which were awarded hearty votes of thanks; and Mr. G. D. Milburn gave a demonstration of the transparent film.

Sixth Session.

BOSTON, August 9, 1889, 11 A. M.

President McMICHAEL—The meeting will now come to order. You will listen first to the reading of communications.

Secretary SCOTT then read the following communications:

CABLE DISPATCH.

“PARIS, FRANCE, August 8, 1889.

“*To H. McMichael, President of P. A. of A.:*

“Thanks from the International Congress of Photography. Sympathetic compliments.

“JANSSEN, *President.*”

Secretary SCOTT—Here is the list of the Air Brush prizes.

The Air Brush prizes were then announced.

President McMICHAEL—The reports of committees are now in order.

Secretary SCOTT—The committees on the several awards do not seem to be ready to make their reports, and it is suggested that we have an adjourned meeting this afternoon to make those announcements. A few of them have handed in their reports, but the majority have not, and are not ready.

President McMICHAEL—Here is the report of the Committee on the Centennial Exposition of 1892. In addition to Dr. Elliott, W. I. Lincoln Adams, W. H. H. Clark, J. F. Ryder and W. J. Entekin.

Dr. ELLIOTT—When I got up yesterday to speak about having four other members put upon that committee, I did it with the intention and with the one idea that photographers, practical photographers, should be represented on that committee, and with the idea of having one man who is a practical photographer act as delegate to that exhibition. Now, with regard to photographic manufacturers and journalists, they will be represented. I already know of one of the delegates of the New York Board of Trade who will represent the photographic manufacturers. I have no doubt the journalists will be well taken care of. I must say that I think the men who are on that committee, with whom I shall have the honor of acting, all ought to be practical photographers. And since there is a question

whether it shall be New York, Chicago or St. Louis, I think it would be wiser to put on men belonging in those cities, men who are photographers, and not journalists alone. For my own part, I feel that it is too much of a responsibility for me to go to that exhibition to represent this body. You are photographers. I am not a photographer. Certainly there are among you photographers enough, practical men, good men, to go to represent you at the World's Exhibition. Stock dealers will be represented. You need have no fear about that. You want a photographer; and I do not think that committee is now well balanced. The majority of the men on it are journalists.

The *President*—They have two photographers.

A *Member*—Mr. Clark, of the St. Louis journal, was a photographer, I believe, for twenty years.

The *President*—W. J. Entekin is a photographer.

Mr. STANTON—I will say that I would have been very glad had my friend Bogardus been placed upon that committee. (Applause.) I think it would be an honor to the committee.

The *President*—Gentlemen, you only gave me a chance to put on four. There are about fifteen or twenty who ought to be put on, but there was not room. We did the best we possibly could. I presume if I were to put on four more there would be the same objections. We cannot have them all on.

Mr. GUERIN—I move you that we put nine men on that committee.

The *President*—There was a motion carried that it should consist of four, in addition to Dr. Elliott.

Mr. GUERIN—We can make a motion that the number be increased to nine men?

The *President*—Yes.

(Motion.)

Mr. GUERIN—How many photographic journals are there in the States? Because I think every one ought to be on the committee, and about an equal number of photographers.

Dr. ELLIOTT—It seems to me that you ought to have a representative who is a photographer. The bulk of this committee should be photographers. I thoroughly appreciate the honor you have conferred upon me, but I am not thinking so much of myself as of your having a representative. You must remember that there will be hundreds of men on the committee, acting in conjunction with each other at the World's Fair. You want a

representative man. You cannot call me a representative man in the Photographers' Association of America. You can hardly call any of the journalists so. But I do not wish to speak for them. I speak for myself. I wish you would remember that in making up this committee. You will find it is important when the time comes to act.

The *President*—I would like to ask Dr. Elliott if there is one man to be chosen from this committee for a commissioner?

Dr. ELLIOTT—One man out on the committee.

The *President*—Then they can choose whom they want to afterwards. They can choose a photographer or a journalist, whichever they like.

Dr. ELLIOTT—I understood that they were to choose one of the members of the committee as a delegate, one of the five or of the nine?

The *President*—Then they can choose a photographer, if they wish to.

Dr. ELLIOTT—If you give them instructions to that effect. They might select a journalist.

The *President*—We cannot control that. They will take a photographer if they think best. If we put on both of these classes, they can choose which they like.

(Question called for, and the motion to increase the number to nine carried.)

Mr. STANTON—If nominations for that committee are in order, I will nominate my friend Bogardus.

The *President*—Do I understand that the Association will make this addition?

Dr. ELLIOTT—According to the original motion, the President of the Association has the power to appoint that committee.

The *President*—I would prefer to have the Association do it.

Dr. ELLIOTT—I move that the other four members of the committee be voted for.

(Motion carried.)

The *President*—Nominations are in order.

Mr. STANTON—I would nominate Mr. Bogardus as a member of that committee.

(Nomination seconded.)

A Member—I nominate Mr. Appleton.

(Nomination seconded.)

A Member—I would nominate Mr. Guerin, of St. Louis.

Mr. GUERIN—I beg leave to decline. I expect to be up Salt Creek about the time of the World's Fair, and I must decline.

C. T. Steward, of Hartford, was then nominated, and the nomination was seconded.

Mr. BARKER—Gentlemen, I would like to place before you a man who, for the past few

years, has shown as much energy and push as anybody who has ever held an office in this Association. I take great pleasure in nominating Mr. H. McMichael, of Buffalo.

(Nomination seconded.)

The *President*—There are four nominations, just enough to fill the bill.

Mr. CRAMER—I move that the Secretary cast a vote for the Association.

(Motion carried.)

Secretary SCOTT then cast a ballot for the Association, which was announced by Mr. Hastings, as follows:

Mr. Bogardus, Mr. Stewart, Mr. Appleton and Mr. McMichael.

The *President*—Is there any more unfinished business?

Mr. CRAMER—Under the head of unfinished business, I would like to say a few more words about the Daguerre monument, because that is not finished yet; that is certainly unfinished business. As we have happened to select Washington for our next place of meeting, and have also decided, by a vote, that the Daguerre monument shall be placed there, in the Smithsonian Institute at Washington, it will be a great source of joy for all of us who may meet there to see the monument finished. It is only a short time, only one year, before the next meeting. The collecting of contributions, the perfecting of plans and the finishing of the monument will take some time. Therefore, I would urge the committee to exercise all possible dispatch, so that we may have the pleasure of seeing the monument finished when we meet at Washington. In order to get as many contributions as possible, I would propose a plan which I think may be made to work very satisfactorily; and that is, that every member of the Association and every photographer throughout the land should appoint himself a committee of one, and collect, wherever he can, some funds for this noble purpose (applause), by opening a box in his studio for the reception of contributions to the Daguerre monument. There will be plenty of educated and intelligent people in the United States who will be willing to contribute their mite to this enterprise. I would like to see that monument ready when we meet next year. That is about all I have to say. The point I want to bear on particularly is, that all of you should try your best to collect money for this purpose from photographers and all other people.

As an inducement to getting up collections for the Daguerre fund, I would say now, that the original picture of Daguerre has passed into my hands and is now in my possession.

And I shall have fifty copies of it made from the original daguerreotype and shall offer these fifty pictures of Daguerre to the fifty men who raise the largest contributions. (Applause.) That includes the journals also. Let each try to get ahead of the other.

The *President*—Is there anything further under the head of unfinished business?

A *Member*—Does not the election of officers come under the head of unfinished business?

The *President*—I believe it does. We will proceed to elect the rest of the officers. Nominations are in order for First Vice-President.

A *Member*—I beg leave to nominate for First Vice-President an officer who has already served an honorable and creditable apprenticeship, and who is well qualified to fill the office. He is one whom you well know both as a gentleman and artist. I beg leave to submit the name of Mr. Hastings, of Boston, the President incumbent.

(Nomination seconded.)

Mr. CROUGHTON—I beg leave to nominate a person who fulfills all the conditions that the last speaker has given to the name which he presented. I nominate O. P. Scott.

The *President*—I believe Mr. Scott is the nominee of the nominating committees. If there are no more nominations we will proceed to ballot.

Dr. ELLIOTT—While we are balloting I would like to say a few words. Why can we not make arrangements about the completion of a Daguerre monument now, while we are in session, just as we did in regard to the place where it should be put? I move you that, as the present officers of the Association, the Executive Committee, use the money, get the plans and prepare the monument—I move you that this matter be all finished before these gentlemen go out of office. That is to say, they will go out of office on the 1st of January next, and in the interim between this time and that I move that they get the subscriptions closed up and the plans submitted, and get the plans sent abroad, for I suppose we shall be obliged to have it made in Paris.

(Motion seconded.)

Mr. CRAMER—I would offer as an amendment, that the time be the next meeting of the executive officers, instead of the 1st of January.

(Motion carried.)

Mr. ARTHUR A. GLINES (of Boston)—According to this vote, which we have just taken, I do not see that this Association is going to have a chance to subscribe anything to this fund. I made a motion previously

that we appropriate a thousand dollars. That was not carried, and the idea was to wait until a year from now. The vote just passed would prevent our contributing anything as an Association. I would make another motion, that we appropriate \$500 as an Association.

(Motion carried.)

The *President*—Mr. Dixon, of Toronto, wishes to make a few remarks in regard to the Photographers' Convention in Canada.

Mr. Dixon was greeted with applause, and spoke as follows: As we are going to hold our Convention over there on the 20th, 21st and 22d, I would like to invite all of you who will to come over. And I would also invite those who cannot come to send a few exhibits. I will see that they are taken through the Custom House and put up properly, and we will send them back free of charge. They will do us a great deal of good, especially the exhibits of those parties that are taking prizes. They would do us a great deal of good, and I will see that they are sent back free of charge. (Applause.)

The *President*—The following is the result of the ballot: Mr. George Hastings, 73; O. P. Scott, 62.

Mr. SCOTT—Ladies and gentlemen, I move that we make this election unanimous for our honorable friend, George H. Hastings.

(Motion carried.)

Mr. HASTINGS—*Members of the Association*,—I thank you very much indeed for your kind expression, and I will try to merit the honor which you have this day placed upon me. (Applause.)

(To be Continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. L. writes: Will you oblige me with a recipe for developing and intensifying wet plate negatives for zinc-etching process?

A.—As a developer the following is a good formula:

Ferrous sulphate.....	30 grains.
Glacial acetic acid.....	20 minims.
Alcohol.....	15 “
Water.....	1 ounce.

For intensifying bleach the fixed negative by flowing with the following:

Copper sulphate.....50 grains.

Potassium bromide.....30 "

Water.....1 ounce.

Wash thoroughly; then flow with silver nitrate solution, 100 grains in the ounce of water. Repeat the bleaching and washing until sufficient density is obtained.

Q.—J. H. O. writes: Will you please tell me why the inclosed print has those blue spots and why it will not tone? The paper was floated on a fresh silver bath 60 grains strong for three minutes. Used well water, filtered. Wished a black tone.

A.—The fault is probably in your silver bath. Shake it up with kaolin (white china clay), and filter. Fume the paper twenty or thirty minutes with ammonia and print deeply for black tones. The following is a good formula for working albumen paper:

Silver nitrate.....6 ounces.

Water..... $\frac{1}{2}$ gallon.

Liquid ammonia.....1 dram.

Alcohol..... $\frac{1}{2}$ ounce.

For toning use:

Water..... $\frac{1}{2}$ gallon.

Soda bicarbonate..1 tablespoonful.

Soda acetate.....1 teaspoonful.

Gold chloride, Anthony's liquid..1 bottle.

Add the gold just before using. This gold bath will tone twenty-five sheets of paper.

Q.—A. R. writes: I want to put up a wooden washing box for negatives, and take the liberty to inquire what I have to use to make the joints water-tight. Is it paraffine alone, and how is it applied?

A.—Use good paraffine, and be sure that the wood is perfectly dry before you apply it. A good plan is to allow the box to stand in a warm dry place for about one week; then use a flame to heat the joints until they begin to turn brown from charring. Now apply the paraffine hot and smooth it into the joints with a hot iron.

Q.—F. H. writes: Please tell me through the BULLETIN the best way to build a light. I have a room 40 x 20 on second floor. It will be a north light, top and side.

A.—Consult Wilson's "Photographics" and read the chapters on "The Glass Studio" and "The Accessories and Light." The subject is too long to treat satisfactorily in these columns.

Q.—H. H. writes: Will you please tell me where I can find a good process for making enlargements from small photographs on por-

celain glass. Have been trying it with the wet collodion process, but the whites are very yellow. Would like to find a good quick way of doing it. Do you know of an albumen process either of silver or platinum that can be worked easily?

A.—You should write to some of the dry plate makers. They sometimes coat opal glass plates with gelatine emulsion, and would be able to give you the information you ask. There would be no difficulty about getting clear whites with a sufficiently slow emulsion. You will find several albumen processes in the "Silver Sunbeam," issued by the publishers of the BULLETIN. See pages 237 to 241 of that volume.

Q.—W. D. T. writes: Will you inform me, through the columns of the BULLETIN, how I can make retouching fluid? Have tried turpentine, with resin, etc., but with little success. It doesn't give "tooth" enough, and is quite sticky. Grinding with pumice-stone, etc., doesn't give as much "tooth" as I would like, and besides makes it denser where the grinding is. How do the best retouchers prepare their negatives? I can do good retouching, but always have a difficulty in getting the negative to "take the pencil." Also please give me a scale of proportionate prices for the various sizes of photographs, cabinet, Victoria, promenade, panel, boudoir, imperial, $6\frac{1}{2} \times 8\frac{1}{2}$, 8×10 , 10×12 , 14×17 and 16×20 . I have two works on retouching—"The Art of Retouching" and "The Modern Practice of Retouching"—but they don't contain the information required.

A.—In regard to retouching consult the BULLETIN for 1888, pages 656, 684, 713, 756, in Nos. 21, 22, 23 and 24. You will there find much information about retouching and varnishes. The details are too lengthy for these columns. In regard to latter part of question, we cannot answer. Consult some card mount manufacturer.

Q.—W. B. writes: Will you kindly inform me, through the columns of your photographic BULLETIN, which is the best magnesium flash-light lamp; first, as regards safety, and secondly, as regards light?

A.—For small work we prefer the Mize flash-lamp. For large groups and interiors the Reeves lamp works admirably. Both use pure magnesium powder and are perfectly safe.

Q.—E. C. writes: Will you please give in the BULLETIN a good formula for a hydroquinone developer—one that will work well and keep well?

A.—The following is a good formula and keeps well :

No. 1.

Hydroquinone.....110 grains.
Potash metabisulphite ... 30 “
Sodium sulphite..... 1 ounce.
Water..... 16 ounces.

No. 2.

Potassium carbonate... 1½ ounces.
Water.....16 “

For use mix one volume of No. 1 with one-half volume of No. 2. Use more of No. 2 if detail hangs back. Leave plates in developer until sufficient density is obtained.

Views Caught with the Drop Shutter.

MR. J. R. CLEMONS, of Philadelphia, gave us a call recently. Although sixty-eight years of age Mr. Clemons is still interested in photographic work. His son accompanied him and we were glad to see both these gentlemen.

W. D. GACHEL, of Louisville, Ky., has recently opened a branch store in Birmingham, Ala. His trade in the South has increased so largely that he feels this branch of his business to be a necessity in order to serve the increasing wants of his customers in Georgia, Alabama and Mississippi. Mr. A. D. Gatchel, a son of the senior partner of the house, will have charge of the Alabama branch, and his experience with his father will serve him well in the new branch. We wish the new enterprise every success.

COLONEL V. M. WILCOX, President of the house of our publishers, has just returned from the annual reunion of his regiment, the 132d Pennsylvania Volunteers. One hundred and

seventy-five of his command met at Scranton, and Colonel Wilcox was elected President of the 132d Regiment Association for the coming year. The survivors met at the Academy of Music in the evening, and the Colonel delivered an address to the survivors of his old command and gave some reminiscences of the interest taken by the citizens of Scranton during the early part of the war, and referred to the many changes that had taken place in the city since he resided there twenty-eight years ago.

The meeting was to commemorate the Battle of Antietam, and was its second reunion.

WE have before us the nineteenth editions of S. R. STODDARD's well known guides to the "Adirondacks," "Lake George and Lake Champlain." It needs no words of ours to commend these valuable hand-books; the fact that they have passed through so many editions is enough to tell of their worth. Mr. Stoddard has been a resident of Glens Falls, N. Y., for many years, and writes of the localities from personal knowledge and a love of the beauties they contain.

"THE ADIRONDACKS."—A series of artotype views of that interesting region come to us from Mr. E. Bierstadt, of Reade street, New York. They are admirably selected, beautifully reproduced and artistically bound in a little portfolio. To those who wander in the New York wilderness in summer, these will prove a charming set of souvenirs.

SUN AND SHADE, the now well established photographic picture paper, is again on our table, full of interesting views of art works. The photo-gravure work is fully up to recent issues and in some instances shows an advance over former efforts. It is certainly a beautiful periodical.

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"FINE FEATHERS MAKE FINE BIRDS."

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

OCTOBER 12, 1889.

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EIKONOGEN.

THIS new developing agent has certainly come to stay, at least until something better is discovered. The rapidity with which it works, the clear black and white negatives that are so readily obtained with it, reminds the worker of collodion days, and the iron developer. There is perhaps a little more care needed in judging of time in the longer exposures where small diaphragms are used in the lens. But for instantaneous work with large openings in the lens, eikonogen works with all the vigor of pyrogallol, and will give more detail in negatives of the same exposure than when using pyrogallol without the risk of staining or fogging the negative.

Dr. J. Schnauss, in *Photographisches Archiv*, speaks thus of his recent experiments with the new developing agent. "For the past six months I have worked only with hydroquinone. The action and formulas for this developer are closely analogous to eikonogen, it is therefore not very difficult to become acquainted with the latter.

Experience shows in both cases, that fresh solutions are only useful for the development of instantaneous views, whereas time exposures should have an addition of bromide of potassium, or better still should be developed with partly old developer. It may also be stated for both developers, that carbonate of potassium develops quicker than carbonate of soda, but at the same time it has also a greater tendency to frilling. Under these circumstances an alum bath would be advisable in both cases.

Preliminary baths have been used very seldom for hydroquinone, which is certainly a good thing in its favor; these are recommended, more for oxalate and lately for eikonogen, to help under-exposures, particularly in instantaneous pictures.

In the rapidity of development of the latent picture, with equal strength and the same age of the solutions—whether fresh or already used—and equal quantities of the same carbonated alkali, I have observed no difference with equal duration of exposure on the same kind of plate. But in the strength of the negative there is an essential difference in favor of the hydroquinone. The latter develops undoubtedly much more powerfully, while the eikonogen

produces less depth, but better half-shadows. The latter is therefore better for portraiture, while the hydroquinone is more suitable for landscapes and reproductions. The formula for mixing the eikonogen solutions, as published in the prospectus by the manufacturer, has given the best results, while the prescription of E. Vogel, published in the last number of the *Archiv*, recommending only half the quantity of eikonogen and more alkali (carbonate of potassium) gave flat, much too weak negatives, requiring always strengthening.

Plates developed with eikonogen, even if applied in extra strong solution, require, with the exception of the instantaneous negatives, almost always intensifying, at least for albumen points."

What Dr. Schnauss says about the details in the half-tones we have confirmed by our own experiments; but we cannot agree with him about hydroquinone being better for landscape work. With reasonably good judgment of the light, negatives of the highest character can be obtained with eikonogen, and in every respect equal to hydroquinone. There is also the added advantage that eikonogen works much more rapidly than hydroquinone. We have developed a number of negatives with eikonogen, and have never found it necessary to intensify them, unless the eikonogen solution was too weak. Here also we may remark, that weak solutions with much alkali have a tendency to fog. The negatives from weak eikonogen developer were flat and without density, thus confirming what Dr. Schnauss says about the use of more alkali and less eikonogen.

It is probable that eikonogen will be cheaper, like all other new developing agents, as economy in its manufacture is attained; but when we take into consideration its rapidity of action compared with hydroquinone, and its freedom from the foggy and staining qualities of pyrogallol, it seems destined to be a very decided improvement in developing agents.

EDITORIAL NOTES.

SOME time ago we had to record the loss of Mr. Donkin, the English amateur, while photographing in the mountains of the Caucasus. The real fate of the intrepid climber was unknown until recently, when Mr. Dent, the President of the British Alpine Club, set out to learn more definitely of his untimely end. The party, led by Mr. Dent, climbed Mount Dychtan and discovered the photographic outfit of the unfortunate Donkin on the verge of a precipice, leaving no doubt that he and his companions had slipped over and been killed. Mr. Donkin's Alpine views are famous.

FROM recent experiments in the Mediterranean Sea it has been determined that light penetrates the ocean to the depth of 1,518 feet, or 300 feet less than former determinations. This fact was ascertained by the use of gelatino-bromide plates of great sensitiveness, and is an interesting contribution to scientific knowledge.

NOT long ago we had to chronicle the photographing of a cannon ball during its flight through the air. Now we hear that a picture has been obtained of a rifle bullet, a much smaller object, under like circumstances. Truly the sensitiveness of bromide of silver is marvelous.

THE camera is often useful to the engineer, but never more so than in proving that his work does not injure adjacent property. Recently a suit for damages

was brought against the builders of the Southwark London subway, a tunnel under the River Thames. It was claimed that the building of the tunnel had caused the cracking of the walls of houses near it. Unfortunately for the petitioners, the engineer had taken photographs of the buildings in question before the work was begun, and these pictures clearly exhibited the cracks said to be caused by his work; they were old fissures.

PHOTOGRAPHIC literature in Europe has recently received several additions in the form of new journals. In England a "Photographic Quarterly" has been started by the editors of the *Amateur Photographer*, and a monthly called "Photographic Scraps" by the makers of the Ilford dry plate. In Germany, after October 1st, the *Photographische Wochenblatt*, which during its fifteen years' existence gained a reputation under the able editorship of Dr. F. Stolze, ceased to be the official organ of the *Photographische Verein*, and will henceforth be published as an independent paper, the publishers and owners having engaged the services of Dr. A. Miethe, a gentleman well known in scientific and photographic circles, as its future editor. Dr. Stolze will be the editor of the new journal and present organ of the *Photographische Verein*. It is a weekly issue, under the title *Photographische Nachrichten*, and to judge from the prospectus, and in such experienced hands as those of Dr. Stolze, it will be one of the standard papers for information, and its success is undoubtedly secured.

PROFESSOR ROMYN HITCHCOCK, of the Smithsonian Institution at Washington, has recently returned from Japan by way of Europe. We hope at an early date to have some interesting communications from his pen.

THE New York Camera Club held its first quarterly meeting after the summer vacation on Wednesday evening, October 9th. We shall give an account of the proceedings later.

At a recent meeting of the Society of Amateur Photographers of New York, the lantern slides of the Camera Club of London were exhibited and were unusually fine. Among the more prominent slides shown were those of Messrs. George Davison, Lionel Clark, J. Gale and H. P. Robinson, embracing marine and river views, rural groups, mountain scenery, and some very life-like scenes of the animals in the Zoological Gardens in London.

THE Photographic Association of Canada, at its meeting in Toronto, August 23d, elected the following officers: *President*, S. J. Dixon, of Toronto; *Secretary* and *Treasurer*, E. Poole, of St. Catherines. Report of meeting later.

WE are indebted to Mr. F. K. Morrill, the Secretary of the Chicago Camera Club, for two excellent views of the new club-rooms. One of these is the lecture-room, neat and comfortable, with screen for the prejection of lantern slides; the other is a view of the studio, with skylight, backgrounds and screens for the management of the light. With such good facilities we hope to hear of some very successful work from the club.

At a regular meeting of the Cleveland Camera Club, held Tuesday, September 10th, the following officers were elected: *President*, Montague Rogers; *Vice-*

President, Frank J. Dorn; *Recording Secretary*, Dr. Robert Dayton; *Corresponding Secretary*, Alfred C. Ogier; *Treasurer*, William F. Dorn; *Directors*, Frank F. Ogier and Joseph Di Nunzio. At the next meeting the subject will be "Our Summer Work."

THE regular semi-annual election of the Hobken Camera Club took place at their rooms, 140 Washington street, and the following officers were elected: *President*, George E. Mott; *Vice-President*, A. J. Thomas; *Secretary*, Richard Beyer; *Treasurer*, Charles L. A. Beckers; *Custodian*, George Steljes. *Instruction Committee*: William Allen, Charles L. A. Beckers, William Sachs. *Literary Committee*: A. J. Thomas, Richard Beyer, A. C. Ruprecht, George Steljes, Charles L. A. Beckers. The meeting was well attended, and considerable business was transacted. The regular Fall Outing of the club took place October 5th and 6th to Conashaugh, Pike County, Pa., one of the most picturesque places in the State. A competitive exhibition of the work of the members has been arranged. Some handsome prizes are offered, for which the members are working enthusiastically.

THE PICTURES AT THE BOSTON CONVENTION.

THIRD NOTICE.

President McMICHAEL had a number of fine studies that were not placed in competition; but nevertheless they exhibited painstaking work, and continued progress in the development of artistic photography. Two studies after Bavarian models, "Schwarzwalden" and "To the Kaiser," were among the most remarkable pieces of artistic photography we have ever seen. The exceedingly picturesque costumes lent their aid to the work of the artist; and the marvelous definition, with the wonderful management of the light to bring out the grace and beauty of the models, contributed to make these pictures objects of great beauty. "Schwarzwalden" was a Bavarian girl skipping along with a "stein" of foaming beer. "To the Kaiser," was a Bavarian hunter sitting on a table, with one foot on the ground, holding aloft a brimming mug of beer. The accessories were few, but harmonious.

In the same exhibit were two other pictures of equal artistic value with the above, but having different subjects. These were two illustrations of Shakespeare's "Twelfth Night," and certainly full of the spirit of the great poet.

Landy, of Cincinnati, sent copies of his great pictures, "Man Know Thy Destiny," and "Hiawatha," together with some fine large portraits that were in his best style of work.

Kuebler, of Philadelphia, had a number of fine large pictures, the best of which were illustrations of a "Roman Gladiator," and Mrs. Potter in various scenes of "Cleopatra." The work was finely done in every respect.

Monfort & Hill, of Burlington, Ia., had a fine series of studies, full of artistic feeling and skillfully executed from a photographic point of view. "Fortune in the Cup," the common method of fortune-telling by observing the sediments in an emptied tea-cup, was very well caught. "Eaves-dropping," a prim little waitress listening behind a screen, was another very effective picture. "The Day's Work Done," an old colored man with his pick, shovel and dinner-

pail returning from his day's labor, was particularly fine. While yet another gem was "The Toilet," a little girl dressing the hair of her companion. These artists improve with every effort they make, and we hope to see much more of their beautiful work.

George Barker, of Niagara Falls, had a beautiful collection of views of Niagara and Florida scenery, including some fine interiors taken in the South. Among many new pictures we noted a view of the Cave of the Winds at Niagara, taken from a position hitherto unused and giving some fine effects of light and shade. Another new view was a picture of Luna Island, Niagara, with some very beautiful ice effects; and still another was an 8 x 10 view of the Horse Shoe Fall, taken from the Canada side, showing the wonderful changes caused by the break in the rocks under the falls several years ago. It is needless to say that all the pictures were of the highest photographic value, as Mr. Barker is well-known in work of this character. In the same exhibit were a number of views of New York Harbor, and also of Johnstown after the flood.

W. H. Jackson, of Denver, Colo., did not have as large an exhibit as usual, probably because he sent a fine collection to the jubilee at Berlin, but the work exhibited was exceedingly beautiful. Multnomah Falls, Oregon, a large picture, was full of the wild beauty of that region, and as fine a photograph as could well be imagined. Uncompagne Canon, Colo., was another new picture of large size and a most remarkable photograph. In both these views the wonderful atmospheric effects are so well preserved that the pictures appear to the observer as though he were looking through an open window at the scene. Two other beauties were "The Garden, Santa Barbara Mission, California," and "Green River, Wyoming." There were others, but these are all we can notice here. Mr. Jackson's work is world-renowned, and needs no commendation from us.

Harvard College Observatory sent one of the most interesting exhibits in the whole exhibition. The collection consisted of telescopic views of the surface of the moon, views of Saturn, Venus, Jupiter and others, together with pictures of the observatory and a number of photographs of star spectra. They were mostly 4 x 5 plates, and remarkably good work. We expected to see views of the satellites of Jupiter and Saturn on the same plates with the planets, but could not distinguish them; possibly there was some reason for their absence, but the pictures appeared strange without them; they are surely bright enough to photograph.

Wilfred A. French had a series of charming landscape views on exhibition, and we are glad to note that he was awarded a medal. His work is always artistic, in addition to being photography of a high order.

L. C. Overpeck, of Hamilton, Ohio, had a fine exhibit in a department of photography sadly neglected by the Photographers' Association in their list of awards—we mean machinery. We know of no phase of photographic work that requires more skill and good judgment than the making of good pictures of machinery and interiors containing machinery. In this particular class of work, we must congratulate Mr. Overpeck on his great success. His 18 x 22 pictures of machines were among the best we have ever seen; and it has been our good fortune to see many fine ones, although they are by no means common.

We must now stop our somewhat rambling review of the fine pictures we saw at Boston. We wish we could do justice to them all, but time and space

forbids. We can only congratulate all who exhibited upon being in so excellent an exhibition of the progress of the art of photography. If the next fifty years can show results representing like progress they will be beautiful beyond any conceptions which we now have. And the beauty of the results will come, not from finer artistic ideas in the photographers themselves alone, but from a deeper and keener insight into the nature of light as worked out by the chemist in his laboratory. Probably photography in colors.

SUGGESTIONS AS TO THE USE OF CERTAIN NEW ORGANIC REDUCING AGENTS AS DEVELOPERS.

BY JAS. H. STEBBINS, JR.

[Read before the Society of Amateur Photographers of New York.]

FROM long usage we have become accustomed to and thoroughly understand the properties of such developers as pyrogallol and ferrous oxalate. Within the last two or three years a new organic reducing agent was brought to our attentions, namely, hydroquinone. This compound has now also become thoroughly known, so that it will be useless for me to say anything about it here. These three substances are practically the only organic reducing agents used at the present time, and it is my intention in this paper to suggest certain other compounds which may possibly be used for this purpose. Some of these compounds I dare say have been already tested, but others I am convinced have not, and I therefore offer them to you, with the hopes of inspiring some with the desire to make original investigations in this direction.

Resorcine.—Isomeric—that is, having the same formula as hydroquinone, but possessing different properties—is resorcine. This substance, as I have already described in a previous paper, is prepared by fusing benzole disulphonate of soda with caustic soda, setting the phenole free with hydrochloric acid, and extracting with ether. It is a white crystalline body when pure, having the formula $C_6H_4 \begin{smallmatrix} OH \\ < \\ OH \end{smallmatrix}$, and is, chemically speaking, a metadioxybenzole. I have experimented with this substance, using carbonate of soda and carbonate of potassium, without, however, obtaining any satisfactory results. H. Tóth and Eder (Phot. Corresp., Vol. 17, p. 191), however, say that in an ammonial or caustic soda solution it reduces gellatino-bromide plates quite well, although somewhat slower than pyro.

Pyrocatechin, $C_6H_4 \begin{smallmatrix} OH \\ < \\ OH \end{smallmatrix}$, the third isomer of hydroquinone, is said by the same authorities (loc. cit.) to work quite well also. This substance crystallizes in rectangular prisms, belonging to the orthorhombic system, and chemically speaking it is an orthodioxybenzole. Eder and H. Tóth, in their experiments, used a 5 per cent. pyrocatechin solution, to which they added two or three drops of ammonia for every 20 cubic centimeters.

Phloroglucine, $C_6H_3 \begin{smallmatrix} OH \\ = \\ OH \\ = \\ OH \end{smallmatrix}$, an isomer of pyrogallol, has also been tried by

Eder, who states that even in a strong ammoniacal solution it works very poorly, as the reducing action is very slight. Perhaps in a caustic soda solution it might work better. This substance is best prepared by fusing resorcine with caustic soda. It crystallizes in hard rhombic prisms, having a very sweet taste.

Some time since I made a few tests with phenylhydrazine chloride, and found that this substance in a caustic soda solution reduces chloride of silver very easily. I did not extend my experiments to bromide of silver, but have no doubt but that it will reduce the latter too.

This compound may be prepared by reducing diazobenzole chloride with tin and hydrochloric acid, and it has the formula $C_6H_5-NH.NH_2.H\ Cl$. It crystallizes in little pearly plates, which are quite soluble in water, and altogether it is a very remarkable compound.

While reading over the *Berichte* of the German Chemical Society, some time since, I ran across an article by O. N. Witt, loc. cit., 1888, p. 3468, entitled, "Reduction Products from the Azo-coloring Matters of the Naphthalin Series." This article describes a number of compounds, which I think may prove useful in photography, though I have not heard of their being used, or even experimented with, for this purpose. I will now give a brief résumé of the same.

Amido-β-naphthol-α-sulpho acid.—This compound was obtained by reducing with stannous chloride and hydrochloric acid a yellow dye-stuff produced by the action of diazobenzole-chloride upon β-naphthol-α-sulpho acid. The above amido-naphthol-sulpho acid crystallizes from the hot reaction mixture in little right angled, indented, rose red leaflets. It is very little soluble in boiling water, but a trifle more so in an aqueous solution of acetate of soda, from which, on cooling, it crystallizes out again. Alkalies and alkaline earths dissolve it very readily, and the solutions thus obtained, when left exposed to the air, turn rapidly orange brown. Oxidation products color either the neutral or alkaline solutions of this acid yellow to brown. The most peculiar feature of this salt, as well as of those that are to be described further on, is the fact that it reduces silver salts either in acid or alkaline solutions to extremely finely divided metallic silver. This peculiarity would, in my opinion, make the new compound an extremely valuable one for use in developers. Lack of time has prevented me from making tests in this direction, but I have every reason to believe that this compound, as well as some of the others to follow, can be made to take the place of pyro, etc.

Amido-β-naphthol-β-sulpho acid.—This compound is isomeric with the foregoing one, and may be obtained by reducing the orange dye-stuff produced by combining diazobenzol-chloride with Schäffer's β-naphthol-β-sulphonic acid. It is obtained from the reaction mixture in little white crystals. In small quantities it may be dissolved in boiling water, without decomposition; and if the solution thus obtained be rapidly cooled down with ice, the amido-acid crystallizes out unaltered in little snow-white needles. By slow cooling of the aqueous solution it is decomposed, gradually turning brown. In alkaline solutions it behaves similarly to alkaline pyrogallol solutions. It likewise reduces silver salts to metallic silver.

Amido-β-naphthol-δ-sulpho acid.—This compound is isomeric with the foregoing one, and was obtained by reducing the dye-stuff produced by combining diazobenzol-chloride with Cassella's naphthol-sulpho acid, F. Crystallizes in glistening rose red needles. The cold aqueous solution of this compound reduces nitrate of silver only after a few seconds, and not, like the beta acid, the very moment they are mixed.

Amido-β-naphthol-α-disulpho acid.—This compound is obtained by reducing the aniline-azo-derivative of naphthol disulpho acid R., known in commerce as

“ponceau 2 G.” Crystallizes in snow white needles, with silky luster. It reduces silver salts immediately to metallic silver.

Amido- β -naphthole- γ -disulpho acid.—This compound is obtained by reducing a dye-stuff known in commerce as “ponceau G.” It is isomeric with the previous compound, and crystallizes in snow white prisms. This compound reduces silver nitrate to metallic silver, but only after a few minutes’ contact with the latter.

Orthonaphthylendiamine- β -disulpho acid.—This compound was obtained by reducing the dye-stuff produced by combining diazo-benzol-chloride with β -naphthylamine monosulpho acid, and known commercially as “Golden Brown.” It is thus obtained as a yellowish white crystalline meal. It reduces silver salts, but the author gives no particulars concerning the same.

Orthonaphthylendiamine- δ -sulpho acid.—This compound is isomeric with the foregoing one, and may be obtained by reducing the dye-stuff produced by combining diazo-benzol chloride with β -naphthylamine- δ -sulpho acid. It is thus obtained as a grayish powder. It reduced nitrate of silver which has been acidified with nitric acid quite rapidly.

Orthonaphthylendiamine- ψ -sulpho acid.—Isomeric with the previous compound. It may be obtained by reducing the aniline-azo-derivative of Dahl’s sulpho acid No. 3, known as β -naphthylamine- γ -monosulphonic acid. Crystallizes in light brown, glistening leaflets. It reduces silver salts.

Without wishing to appear tedious by the description of so long a list of new compounds, I cannot close this paper without making a brief mention of two other substances from which I think good results might be obtained. I refer, namely, to para-phenyldiamine, which may be obtained by reducing paranitracetanilide with tin and hydrochloric acid; and to dimethyl-para-phenyldiamine, which may be obtained by reducing nitroso-dimethyl aniline with zinc dust. Both compounds, especially the latter, absorb oxygen from the air, and for this reason they might make good reducing agents.

At the time I read this paper before your Society, my manuscript was not completed, and illness shortly afterward intervening, has prevented me from completing it till recently. A few days since, upon my return from the country, where I had gone to recuperate, my attention was called to a new developing reagent known as “eikonogen.” Imagine my surprise when I learned that this new compound was nothing more nor less than amido- β -naphthole- β -sulphonic acid, which I described in the early part of this paper, over three months ago. I do not know to whom the priority of this discovery is due, or even whether it is patented, but, as I was the first to suggest its use as a developer in this country, I think I am entitled to some recognition for the same.

September 15, 1889.

(From Photographische Mittheilungen.)

FURTHER EXPERIMENTS WITH THE PYROCATECHIN DEVELOPER.

By DR. CARL ARNOLD, Hanover.

THE hope expressed by me some time ago about a reduction in the price of pyrocatechin, as soon as it can be produced in larger quantities, seems not to be realized, according to information I have received recently from Dr. Schuchardt, in Görlitz. This gentleman, at my request, very kindly had made at his factory a so-called technical—that is, not chemically pure—preparation, which, when tested by me, had almost the same action as the chemically pure preparation;

but it cannot be produced for less than 0.8 mark per gram. Further tests proved that at a price difference of only 20 per cent., the preference has by all means to be given to the completely pure preparation, the latter showing after eight weeks in aqueous solution the same action as on the first day, while the so-called technical pyrocatechin, in consequence of the foreign admixtures, loses from day to day its reducing capacity in aqueous solution. While stating in my first article the reducing capacity of the pyrocatechin in comparison to hydroquinone as 15:1, it has now been shown that the reduction capacity is so enormously great, that the price of one mark per gram does not come into consideration at all, as from one hundred to one hundred and fifty plates of 13 x 18 centimeters can be developed with this quantity. The quantity of the carbonate of potassium can also be considerably reduced, if one possesses the necessary patience during development, which is of great importance with many plates, which frill easily in a solution containing 5 per cent. of potash. Soda may also be applied in place of potash, but the negatives produced with the same never possess an equal sharpness and the development proceeds much slower. It appears to me remarkable, that most of the formulas for hydroquinone and pyro-developers contain 8 to 10 per cent. of potash, and that there is still no complaint about frilling of the plates. If such quantities of potash are applied with the pyrocatechin, or even a caustic potash solution is added, plates of very short exposure can also be developed with the same; but I have handled no plates yet (with the exception of the Vergara and celluloid films) which would not frill or wash off the whole film. For these reasons the new developer cannot be recommended for plates of short exposure, but an accelerating preliminary bath might be discovered soon. An addition of sulphite of soda does not influence the durability of either the technical or pure pyrocatechin; it seems even to exercise a rather retarding influence.

For developing I keep in stock: *a*, a 1 per cent. solution of pyrocatechin; *b*, a 20 per cent. solution of carbonate of potassium. Both solutions keep in the light. Of these I apply for well exposed plates of 18 x 24 cm.: 1 c.c. or 16 drops of *a*; 5 to 10 c.c. of *b*; 60 to 80 c.c. ordinary water.

For instantaneous views Solution *a* can be increased to 5 c.c. But this is of less consideration, as the increase of Solution *b* can be increased in this case to 15 to 20 c.c. By a gradual addition of *a* and *b* the development of the picture can, of course, be accelerated or the high lights strengthened.

After my experience with the new developer to the present day, I believe that the same will have a great future, and I would advise experimenting with the same. Still, whatever I have asserted relates only to the pure pyrocatechin I have received from the factory of Dr. Th. Schuchardt, in Görlitz. The properties of the new developer may be shown in the following:

1. The pictures possess a gray, excellent copying tone, and will hardly lose in the fixing bath.
2. Formation of fog has never taken place during my experiments.
3. As soon as the negatives are in the developer they lose their sensitiveness to light almost completely. I develop, therefore, after immersion, in gas, kerosene or candle light, at about one-half meter distance. Even in diffused daylight the development can proceed without any injury.
4. Even at 5 to 6 degrees Celsius no visible slackening of development takes place.

5. Whether exposed for two or thirty seconds, remains without influence upon the result, the development proceeding gradually.

6. The developer does not soil the hands.

7. The price, in consideration of the very small quantity used, is much cheaper than with most of the other developers.

8. The simple compositions of the developing solutions, the easy solubility of its component parts in water, and therefore the possibility of producing highly concentrated solutions, and to measure these from drop bottles.

9. The convenience of carrying only small quantities of the ingredients; 5 grm. pyrocatechin and 1 kilo. potash are sufficient for more than five hundred developments. Total expense, six marks; therefore for a plate 13 x 18, 1.2 pfennigs.

10. The developer should be used only once, the necessary additions to the old developer being sufficient for the preparation of a new quantity.

11. The developing can be done without motion. The moving of the developer however increases the development.

Suitable pyrocatechin forms pure white, scaly crystals, which dissolve colorless in water. By letting the solution fall in drops on the liquid containing the potash, a fine green color will form, which disappears again when the liquids are mixed. The aqueous solution should be colored only weakly yellow when set aside. Mixed developer will not keep.

[From the *Photographic Review*.]

TESTING LENSES.

(Continued from page 560.)

A USEFUL piece of apparatus for testing photographic lenses, especially for the property of working true to focus, called achromatism—which term, however, must be understood to be taken with the reservation previously mentioned—is the focimeter devised many years since by the late A. Claudet. This instrument consists of a horizontal rod or axis, upon which are fixed a number of arms, each at a certain distance from the next one, and each bearing a distinctive number. The arms are so arranged about the axis that they do not hide one another, at all events toward their outer extremities, where the numbers are painted. On looking at the instrument from a distance, and with the eye in a line with the axis of the central rod, the numbers occupy nearly a circle, and each one is at about the same distance from the axis of a lens placed in the position just now supposed to be taken by the eye, but is at a different distance from the lens itself. An improvement to the instrument consists of having printed matter of different size types upon each of the arms. It can then be used for a comparison of the size of character that a lens will define under any particular circumstances. For trying whether the lens works true to focus, the focimeter is arranged so that the central rod shall point directly to the lens, and shall be in the center of the field. One of the arms which is intermediate in distance from the lens is then focused, and a photograph is taken. If the same arm that was focused appears the sharpest on the plate, the lens is true to focus. If, however, another arm is better defined than the one that was focused, the lens is racked in or out until the arm that is sharpest on the plate comes into focus on the ground glass, and the distance that

the lens has been racked is measured. This distance indicates the amount of difference of the visual and chemical foci for objects at the distance at which the focimeter was placed, and consequently the amount of adjustment that should be made after focusing in order to have the picture in focus.

The adjustment for taking a photograph will, of course, have to be made in the contrary direction to that in which it was made when measuring its amount by the aid of the focimeter, so that if after taking the trial photograph it has been necessary to rack the lens out, say a sixteenth of an inch, in order to get the arm sharp upon the focusing screen that was sharpest on the plate, it will, when photographing an object at the distance of the focimeter, be necessary to turn the lens in for the same distance before exposing the plate.

Those who do not care to be at the trouble of constructing a focimeter as just described, can adopt ready means as a substitute. One such means is to stand a row of labeled bottles touching one another in a slanting line, the middle of the line crossing the center of the field of the lens. Another plan is to make a series of saw cuts at equal distances, slanting, but parallel with each other, along the edge of a rod of wood. Printed cards are now stuck into the saw cuts, and the arrangement is placed so that the cards stand up, each one rising a little above the one in front of it. A still simpler plan, and one which admits of the greatest accuracy in measuring the amount of displacement required by the lens, is to focus the middle of a column of printed matter, placed slantwise in the line of the axis of the lens. There being no break of continuity, the line which appears sharpest in the trial photograph indicates exactly the place to refocus upon, in order to measure the amount of adjustment required. We may be excused for again mentioning the necessity for exact register in the fitting of the ground glass and focusing screen before condemning a lens as defective in its correction.

The testing of photographic lenses for the capability of yielding true definition, may be performed by mere inspection of the image in the camera, or in addition a photograph may be taken. The taking of a photograph has the advantage that a record is obtained of the defining power of the lens, and that comparison between the work of two or more instruments can be more easily and exactly made. On the other hand, there is a liability to error and to an appearance of want of definition in the photograph, if the adjustment of the focusing screen and dark slide is not perfect, or if the lens, although defining well, is not true to focus. In order to have a check upon these contingencies, it is desirable when the photographic method of testing is used, to focus upon the slanting column of printed matter mentioned at the end of the preceding article. The testing for defining power and for the property of working true to focus can then too be made at one operation.

In order to arrive at a judgment as to whether a lens defines as sharply as it should do, it is necessary to have something which represents the standard of sharpness expected from the particular kind of lens. There is no recognized standard, and, for want of it, such absurd expressions as "as sharp as a needle" have been sometimes used to describe exceptionally fine definition. Perhaps the Congress at Paris may settle upon something in the way of a standard for the defining power of lenses. Meanwhile, however, we will describe the standard which we have employed, and which has served to make the work of various lenses comparable. We take a sheet of printed matter that is always to be had

of one-sized type (nonpareil)—namely, the “Births, Deaths and Marriages Column” of the *Standard* newspaper. This column is placed slantwise, the top of the column being farthest from the plate, but each particular line runs square across it as before directed, in the middle of the column, and at such a distance that when a printed line is focused in the center of the field, the image is one-eighth of the original size. The width of two columns in the focusing screen will be just over five-eighths of an inch. With a good portrait lens having an aperture of one-fourth of the focus, the standard adopted as unity by the Photographic Society of Great Britain, up to say a twelve-inch lens at all events, the definition in the center of the field should be such that the small type will on examination with an eye-piece be quite legible. The same test may be employed for all lenses, and those professing to be aplanatic will for the most part be found to pass it, though with different degrees of perfection. Of course by stopping down, almost any lens may be made to define well, at all events in the center of the field; but we are speaking of lenses worked with the largest apertures with which they are supplied, and which in most lenses of the Steinheil aplanatic type—rapid rectilinear—rapid symmetrical, euryscope, etc., will be found to be from $f/7$ to $f/9$. In the newer forms of cemented aplanatic lenses, in which the glass from the Jena factory has been utilized, somewhat larger apertures have been practicable; but whatever the aperture is, it is to be supposed that good definition is obtainable with it, and therefore the test mentioned may be fairly employed.

When we come to examine the defining power of the lens at some distance from the center of the field, we shall find with rapid lenses that there is a very great falling off. Taking again as an example a portrait lens of 12-inch focus, and of aperture $f/4$, and skewing round the camera so that the image is rendered at a distance of 2 inches from the center of the focusing screen, we shall find that the small type of our newspaper column is no longer readable. The larger type used for the heading “Marriages,” etc., should still be legible, but nothing more. Now insert diaphragm $f/8$, No. 4, on the universal system, and the small type becomes again distinguishable. With a Steinheil type lens of $f/8$ aperture the definition at this angle may be expected to be still satisfactory without further stopping down. In order to tabulate the defining powers of a lens at different parts of the plate, a series of examinations may be made of the image given at various given distances from the center of the field, which distances must be proportioned to the focus of the lens, and a note taken of the diaphragm required at each such distance in order to obtain legibility of the printed matter. When the diaphragm has to be small, it may become difficult, on account of deficiency of light, to decide when the type is readable, and then the taking of a photograph affords a more certain means of testing.

It is supposed in all the above trials that the lens is refocused each time that the camera is shifted to obtain a more marginal image. If now the amount which the lens has to be turned in at each refocusing is measured, we have a means for ascertaining the curvature or approximate flatness of field. If the lens had a truly flat field no refocusing would be necessary; but this must not be expected. Draw a line, therefore, the length of the plate, and mark upon it distances equal to those at which the several images upon the focusing screen are examined. At each such distance set out a perpendicular line equal in length to the amount that the lens has had to be turned in at each refocusing.

Join the tops of these lines and we then have a curve representing the curvature of field of the lens. This curved line may be compared with the lines obtained from other lenses, and with an arc having for its radius a line equal to the focus of the lens, at the distance at which it was used for the central image in the trial.

(To be continued.)

[From the *Optical Magic Lantern Journal*.]

DISCS AND THEIR RELATION TO THE LENS.

WHEN one is called upon to give a lantern entertainment in a hall or room, the following questions will be uppermost in the mind of the operator: (1) What size of disc can be obtained with a lens of a certain focus? (2) How far distant from the screen must the lantern be placed in order to get a disc of a certain size with a given lens of ascertained focus? Doubtless many more questions will arise, but these mentioned will be of the most importance. It is a "rule of thumb" practice for an operator to wheel his apparatus up and down a room in order to find the desired position from which to officiate, and the minds of any spectators will not be confirmed in the idea that the exhibitor thoroughly understands his business. How very much more simple and satisfactory is it to reason thus before starting for the place of entertainment: A screen of — feet diameter is required, so if I bring a lens of — focus the lantern must be — feet from the screen, the length of the room being, of course, taken into consideration, in order to ascertain that it is possible to erect the lantern at the desired distance. This having been ascertained beforehand, all that is required is to take an objective of the desired focus, and measure off the necessary space between the screen and the place where the lantern should be set.

Supposing we are called upon to operate the lantern in a hall 25 feet in length, we first ascertain the size of disc desired, which we will suppose to be 10 feet. With an objective having a focus of 6 inches, how far from the screen must the lantern be placed in order to produce a 10-foot disc?

Here is the rule by which it can be ascertained:

Let A = focus of objective.

" B = diameter of slide.

" C = " " disc.

" D = distance between the lantern and screen.

Multiply the diameter of the circle required (C) by the focus of the lens (A), and divide by the diameter of the slide (B).

$$\frac{C \times A}{B} = D = \frac{10 \times 6}{3} = 20 \text{ feet.}$$

It is thus seen that in order to produce a 10-foot disc with a 6-inch objective, the lantern must be placed 20 feet from the screen.

On the other hand, we may possess several lenses of different foci, and it is necessary that the screen and the lantern must occupy certain positions which we will suppose to be just 20 feet apart, and that the diameter of the disc must be 10 feet. How are we to ascertain whether we must use a lens of 4, 5, 6, 7, or other number of inches in focus?

Multiply the distance between the lantern and the screen (D) by the size of opening of slide (B), and divide by the size of disc (C).

$$\frac{D \times B}{C} = A \text{ focus of lens} = \frac{20 \times 3}{10} = 6\text{-inch focus.}$$

Again: We have a lens of 6-inch focus, and intend that 20 feet shall intervene between the lantern and the screen, and wish to know what size of disc can be produced. In order to calculate this it is necessary that we multiply the dis-

tance between the lantern and the screen (D) by the size of slide opening (B), and divide by the focus of the lens used (A), which gives us

$$\frac{D \times B}{A} = C \text{ size of disc} = \frac{20 \times 3}{6} = 10 \text{ feet diameter of disc.}$$

The following Ready Reference Table has been computed by the foregoing rule, and by a glance it will show the relations between lantern and disc with object-glasses of every focus from 4 inches to 15 inches :

READY REFERENCE TABLE.

Distance between Lantern and Screen.	FOCUS OF LENS.													
	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.	13 in.	14 in.	15 in.		
	DIAMETER OF DISC.													
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
10 feet	7 6	6 0	5 0	4 3	3 9	3 4	3 0	2 9	2 6	2 4	2 2	2 0		
11 "	8 3	6 7	5 6	4 9	4 4	3 8	3 4	3 0	2 9	2 6	2 4	2 2		
12 "	9 0	7 2	6 0	5 2	4 6	4 0	3 7	3 3	3 0	2 9	2 7	2 5		
13 "	9 9	7 10	6 6	5 7	4 11	4 4	3 11	3 7	3 3	3 0	2 9	2 7		
14 "	10 6	8 5	7 0	6 0	5 3	4 8	4 2	3 10	3 7	3 3	3 0	2 9		
15 "	11 3	9 0	7 6	6 5	5 8	5 0	4 6	4 1	3 9	3 6	3 3	3 0		
20 "	15 0	12 0	10 0	8 7	7 6	6 8	6 0	5 6	5 0	4 7	4 3	4 0		
25 "	18 9	15 0	12 6	10 9	9 4	8 4	7 6	6 10	6 3	5 9	5 4	5 0		
30 "	22 6	18 0	15 0	12 10	11 3	10 0	9 0	8 2	7 6	6 11	6 5	6 0		
35 "	26 3	21 0	17 6	15 0	13 1	11 8	10 6	9 6	8 9	8 1	7 6	7 0		
40 "	30 0	24 0	20 0	17 2	15 0	13 4	12 0	10 10	10 0	9 2	8 6	8 0		
45 "	33 9	27 0	22 6	19 3	16 10	15 0	13 6	12 3	11 3	10 4	9 8	9 0		
50 "	37 6	30 0	25 0	21 5	18 9	16 8	15 0	13 8	12 6	11 6	10 9	10 0		

EXAMPLES.—An 8-inch focus lens, at a distance of 35 feet, will give a disc of 13 feet 1 inch. To produce a disc of 12 feet, with a lens of 10 inches focus, the lantern and screen must be separated by 40 feet. To produce a disc of 15 feet at a distance of 45 feet, will require a lens of 9 inches focus.

[From *American Journal of Science*.]

THE PROPERTIES OF ALLOTROPIC SILVER.

BY M. CAREY LEA.

THE three forms of allotropic silver which were described in the June number of this *Journal**—the blue soluble and the blue and the yellow insoluble—are not to be understood as the only forms which exist, but as the best marked only. The substance is protean, and exhibits other modifications not yet studied. No other metal than silver appears to be capable of assuming such a remarkable variety of appearances. Every color is represented. I have obtained metallic silver blue, green (many shades of both), red, yellow and purple. In enumerating these colors I do not refer to interference colors produced superficially by reagents, also wonderfully brilliant, but to body colors. As a single instance of coloration the following may be mentioned. I recently obtained a solution of allotropic silver of an intense yellow-brown. A little solution of disodic phosphate changed this to bright scarlet (like Biberich scarlet), presently decolorizing with formation of a purple precipitate. Washed on a filter this changed to bluish green. The colors I have met with in this investigation can only be compared with the coal-tar products, of which one is constantly reminded by their vividness and intense colorific power.

Two of the insoluble forms of allotropic silver, the gold colored and the blue, show in many respects a close relationship and almost identical reactions. There are other respects in which they differ strikingly, and amongst these instability. Blue allotropic silver (dark red whilst moist, becoming blue in drying) is very stable. It may be exposed for weeks in a moist state on a filter, or be placed in a pasty condition in a corked vial, and so kept moist for months without alteration.

The gold colored form, on the contrary, tends constantly to revert to ordinary silver. This is especially the case whilst it is moist, so that from the time

* See BULLETIN, page 353.

of its formation it must be separated from its mother water and washed as rapidly as possible; otherwise it loses its brilliancy and purity of color, and changes to a dark, dull, gray form of normal silver. On the filter its proper color is pure black, with a sort of yellow shimmer (the gold color appearing as it dries); often, especially if allowed to become uncovered by the water during washing, it will change superficially to gray.* But if the washing is done rapidly, with the aid of a filter pump and a pressure of 4 or 5 inches of mercury, the allotropic silver obtained, when allowed to dry in lumps, or brushed over paper or glass, is at least equal to pure gold in color and in brilliancy. With the blue powder such precautions are wholly superfluous.

Of the facility with which the gold colored form is converted into normal silver, I have recently had a somewhat singular proof. I brought with me to my summer home a number of specimens in tubes, some recently prepared, some dating back as far as ten and a half years, together with other tubes containing specimens of white silver spontaneously formed from the gold colored. On opening the box no tubes of gold colored silver were to be found; all had changed to white. But the same box contained pieces of paper and of glass on which the same material had been extended; these were wholly unchanged, and had preserved the gold color perfectly. Apparently the explanation was this—the mere vibration caused by the jarring of a journey of six hundred miles by rail and steamboat had had no effect in changing the molecular form, but the material contained in the partly filled tubes had been also subjected to friction of pieces moved over each other, and this had caused the change. To verify this explanation I prepared fresh material, filled three similar tubes, each one-quarter full, but in one forced in cotton wool very tightly to prevent frictional motion. These tubes were packed in a small box and sent over two thousand four hundred miles of railway. The tubes with loose material came back much altered. One was nearly white, and, as the change has been set up, will probably in a few days be entirely so;† another with loose material was also changed, but not as much as the first mentioned. The tube filled up with cotton came back unaltered, so that continued friction of pieces sliding over each other will cause a change to take place in a few days, which otherwise might have required years, or might not have occurred at all. The permanency of this substance is greatly influenced by moisture, so that when simply air dried before placing it in tubes it is less permanent than when dried at 70 or 80 degrees C. in a stove. Tubes placed in the same box containing the blue form remained unaffected by the motion, though only partly filled and allowed to move freely.

When gold colored allotropic silver is gently heated in a test tube it undergoes a remarkable change in cohesion. Before heating it is brittle and easily reduced to fine powder. After heating, it has greatly increased in toughness, and cannot be pulverized at all.

Both the gold-yellow and the blue forms resemble normal silver in disengaging oxygen from hydrogen peroxide. These two forms, though differing so much in color and stability, and differing also in specific gravity, and in their mode of formation, have many properties in common, not possessed by ordinary silver, and differentiating them strongly from it. They show a vastly greater sensitiveness to reagents, and are also sensitive to light. The ability to form perfect metallic mirrors by being simply brushed in the pasty condition over glass was mentioned in a previous paper.

Many substances which react little, if at all, with ordinary silver, attack the gold colored and the blue allotropic silver with production of very beautiful colors due to the formation of thin films and resulting interference of two reflected rays. In my previous papers I called this the "halogen reaction," because first obtained by the action of substances which easily parted with a halogen. But I have since found that many other reagents will produce the same or similar effects. These are:

* When well washed, this form can also be preserved for a time in the moist condition in a corked vial, as I have lately found.

† Has since become so.

Sulphides.—Paper brushed over with either the gold, the copper colored or the bluish green substance exposed to the vapor of ammonium sulphide, or immersed in a dilute solution of it, assume beautiful hues, though less brilliant than those obtained in some other ways.

Potassium Permanganate, in dilute solution, produces bluish, red and green colors.

Potassium Ferricyanide, in moderately strong solution, gradually attacks allotropic silver with production of splendid blue, purple and green coloration.

Phosphorous acid produces gradually a rather dull coloration.

The color reaction is produced finely by substances which readily part with a halogen—such as ferric and cupric chlorides, sodium hypochlorite, hydrochloric acid to which potassium bichromate has been added—and by corresponding bromine and iodine compounds. In some earlier experiments I obtained effects of the same sort, but in much weaker degree, with alkaline haloids. But with purer products the results have been different. There is at first some darkening, but no true color reaction, and the allotropic silver appears to be gradually converted into normal, so that it is no longer capable of giving the brilliant color reaction with potassium ferricyanide, but, like normal silver, takes a pale and faint coloration only.

The perchlorides of platinum, gold and tin do not give the color reaction, though by analogy one would expect that they should, since they can lose chlorine with formation of a lower chloride.

Action of light.—In a previous paper was mentioned the remarkable fact that the gold and copper colored forms of allotropic silver can be converted first into yellow, and finally into white, normal silver by the continued action of light. The earlier specimens of the blue form became brown by exposure; but purer ones since obtained are likewise converted into yellow by exposure, becoming continually lighter as the action is continued. The conversion from the darker shades to a bright yellow, with full metallic luster, is very easy; but when the previous paper was written I had been only able to obtain the white by keeping the paper on which the silver was coated moist by a wet pad, and by exposing for five or six days. Since then I have found the gold colored silver in a more sensitive form, giving a perfectly white product by exposure dry for half that time.

The white silver thus obtained has all the character of ordinary silver, and does not show the color reaction with ferric and cupric chloride, potassium ferricyanide, etc. Just in the proportion to the exposure to light the ability to give this color reaction diminishes, so that after a day's exposure, when the exposed part has become bright yellow, the color reagents scarcely affect this yellow, whilst the protected part becomes intense blue, purple or green. In this way it is easy to observe the gradual effect of light as it changes the allotropic silver, finally converting it into what resembles in every way and is undoubtedly ordinary silver.

ORTHOCHROMATIC PHOTOGRAPHY WITH GELATINE PLATES.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

[Read before the Photographic Convention of the United Kingdom.]

To address the Convention again on orthochromatic photography presents some little difficulty, because on the one hand there are many in my audience who are well acquainted with the subject, while on the other hand there are some to whom it is not so familiar, and possibly even some to whom orthochromatic photography is only a name. I take it, however, that at this jubilee meeting of photographers it is desirable that the papers should, as far as possible, represent the present position of our knowledge, and I will therefore venture to recapitulate the main points that are already established.

Ordinary gelatine plates fail to represent colored objects with their proper degrees of relative brightness, or, as artists say, with true "values," because the plates are most sensitive to blue and violet rays, much less sensitive to green, and

very slightly sensitive to yellow, orange and red ; while the human eye is most sensitive to yellow, somewhat less sensitive to green and orange, still less sensitive to red, and least sensitive of all to blue and violet. The rays which produce the greatest effect on a photographic plate are those which produce the least effect on the eye, and *vice versa*. As a necessary consequence, blue and violet objects are, in a photograph, much too bright, while green, yellow, orange and red objects are much too dark. It follows that all photographs on ordinary plates of flowers, fruit, paintings and similar objects are unsatisfactory ; in landscape work the foliage is much too dark, and has lost much of its roundness, water reflecting the light from the sky is much too bright, and a slight blue haze, almost imperceptible to the eye, is sufficient to blot out all the delicate details of the distance, on which the beauty of a view so often depends ; in portraiture the flesh tints are much too heavy, and any freckles or similar defects become glaringly prominent.

To some extent these defects may be removed by interposing somewhere between the object and the plate a transparent yellow screen, which absorbs and cuts off the greater part of the blue and violet rays, and gives the green, yellow and orange rays time to act without any accompanying reversal. True values, however, can never be obtained in this way, because ordinary plates are always more sensitive to green than to yellow, and, moreover, the total sensitiveness to green, yellow and orange is so small that under these conditions the exposure required is several hundred times the ordinary exposure. The negatives, too, are usually very deficient in vigor.

Vogel found in 1873 that by treating plates with certain coloring matters, and especially with certain coal-tar dyes, they can be made sensitive to the green, yellow, orange and red, or, as we may term them collectively, the less refrangible rays. The value of eosin for this purpose was first pointed out by Waterhouse in 1876, and Tailfer in 1882 was the first to obtain useful results with gelatine plates, an end which he achieved by the simultaneous application of eosin and an alkali.

Subsequent experiments, and especially those of Eder, have shown that the only dyes of practical value are cyanin and the dyes of the eosin group. These may either be added to the emulsion, or applied to ordinary plates in the form of a bath. In the first case the dye is either added to the materials before emulsifying, or to the melted emulsion before coating. According to Tailfer's specification it is necessary to add ammonia or some other alkali at the same time. In the second case the plates are immersed for a short time in a dilute aqueous or alcoholic solution of the dye, either with or without a certain quantity of ammonia. Sometimes the plate is immersed in a preliminary bath of very dilute ammonia, and sometimes it is washed after treatment with the dye solution ; but neither of these courses is essential. A special modification of the bath method of sensitizing has been described by Ives, and will be referred to again later on.

My previous communications have dealt mainly with the comparative values of the various dyes of the eosin group, which is a somewhat large group ; the efficiency of these and of cyanin so far as regards obtaining true "values" ; and the relative merits of sensitizing in the emulsion or by means of a bath. I also exhibited the results of a number of experiments made with a view to ascertain the value of the methods from a practical photographic point of view. Stated as briefly as possible, the general conclusions arrived at were as follows: For all classes of work orthochromatic methods have considerable, and often very great advantages over the ordinary method. This, in fact, is generally recognized, and these methods are now widely and largely applied in the reproduction of paintings, in microphotography, and in all kinds of work in which colored objects are dealt with. In landscape work their application is not so general, at any rate in this country, mainly, I believe, because the methods of working required to obtain satisfactory results are not yet generally known and diffused amongst photographers. Orthochromatic methods do certainly require more thought and skill than the ordinary method, and cannot be worked successfully

in an unthinking and mechanical way. In the second place, I take it as established that although plates sensitized by means of a bath are somewhat, though not very much, inferior in keeping qualities to those sensitized in the emulsion, they have a much higher sensitiveness to the less refrangible rays. The testimony from many sources in favor of this conclusion is, in fact, overwhelming. Further, erythrosin, applied with ammonia, gives the highest sensitiveness at present obtainable, but the relative sensitiveness to green is too high, and the values obtained are not quite correct; erythrosin without ammonia gives less sensitiveness, but somewhat truer values; rose Bengal with ammonia gives better values than can be obtained with any other single sensitizer, though the degree of sensitiveness is lower than with ammoniacal erythrosin; cyanin is the only dye of practical value as a sensitizer for orange and red, and should be used in conjunction with erythrosin, or, better, rose Bengal, for all objects in which orange and red are at all prominent or important. One of the most important results which I obtained early in my experiments was the fact that a very considerable degree of sensitiveness can be obtained with a bath of erythrosin or rose Bengal containing no alkali at all; with the first dye, in fact, applied simply in aqueous solution, the sensitiveness to the less refrangible rays is as great as that of the commercial isochromatic plates which are prepared according to Tailfer's specification by adding the dye and ammonia to the materials before emulsifying. I understand that Mr. Bedford obtained a similar result when sensitizing in the emulsion. Another interesting result was that, contrary to the statements of some experimenters, I obtained the same sensitiveness with an ammoniacal solution of ordinary erythrosin as with a solution of silver erythrosin. This conclusion has been amply confirmed by the later and more extensive experiments of Professor Zettnow, published in *Phot. Correspondenz* in the early part of this year.

Lastly, with all methods of sensitizing at present known, the relative sensitiveness to blue and violet remains much too great, and correct values can only be obtained by using a transparent yellow screen to absorb and cut off the greater part of the blue and violet rays.

The bath processes having proved to be the most efficient, it seemed desirable to investigate the various modifications which have been proposed, with a view to determine the best method of working. It was already known that the best degree of concentration of the bath depends on the nature of the dye to be used; that a bath too concentrated gives less sensitiveness; and that considerably greater sensitiveness can be obtained when an ammoniacal bath is used than with a simple aqueous solution. It was customary to treat the plates with a preliminary bath of plain ammonia of one or two per cent. It is stated in the Tailfer specification that it is better to add alcohol to the bath, and that the plates should be washed after treatment. The English exploiter of this patent has, indeed, repeatedly asserted that this last part of the process is quite indispensable. Three points then require quantitative investigation: viz., the necessity for or advantage of a preliminary bath; the influence of alcohol in the bath; the necessity for or advantage of washing after treatment with the dye.

The methods of measurement were the same as I described last year. The prepared plates were exposed for ten seconds to the light of the amyle acetate lamp at a distance of 1 meter, the plate being in contact with a Warnerke sensitometer screen, immediately in front of which was a tank containing a 1 per cent. solution of picric acid 2 centimeters in diameter, which cut off all the rays more refrangible than the Fraunhofer line *b*. The plates were all developed together in the same dish, for three minutes, with a developer containing in each fluid ounce 2 grains of pyro, 1 grain of ammonium bromide and 4 minims of liquor ammonia .880. The details of the experiments are given in the following table. The plates used were Edwards' instantaneous and Wratten & Wainwright's ordinary. The dye was erythrosin, and with Edwards' plates the bath contained 1 per cent. of ammonia, and with Wratten's plates 2 per cent. No preliminary bath was used, and the time of immersion was two seconds.

Dye.	Alcohol.	After-treatment.	Sensitometer.	
			Edwards.	Wratten.
1:10000	None.	Not washed.	22	15
1:10000	5 per cent.	Not washed.	22	14
1:10000	5 per cent.	Washed.	22	13
1:10000	10 per cent.	Washed.	22	13
1:10000	25 per cent.	Washed.	22	12
1:5000	5 per cent.	Not washed.	25	13
1:5000	5 per cent.	Washed.	25	13
1:5000	10 per cent.	Washed.	25	13
1:5000	25 per cent.	Washed.	23	12
1:2000	5 per cent.	Washed.	25	15
1:2000	10 per cent.	Washed.	25	14
1:2000	25 per cent.	Washed.	24	13

A second set of experiments, with special reference to the preliminary bath, was made with Edwards' plates and Paget Prize Plates XXX.

Dye.	Preliminary Bath.	After-treatment.	Sensitometer.	
			Edwards.	Paget.
1:10000	None.	Not washed.	25-22	15-15
1:10000	1 per cent. ammonia.	Not washed.	23-22	15-15
1:10000	None.	Washed.	23	15
1:10000	1 per cent. ammonia.	Washed.	22	15
1:5000	None.	Not washed.	22-25	15
1:5000	1 per cent. ammonia.	Not washed.	25-24	15-15
1:5000	None.	Washed.	25	15
1:5000	1 per cent. ammonia.	Washed.	22	15

Both sets of experiments were, of course, made in duplicate. The slight deviations are due to the difficulty of accurately measuring the exposure with the amyl acetate lamp in its original form. Where two numbers are given, the first was obtained with good commercial erythrosin and the second with specially purified erythrosin.

The conclusions to be drawn from the results are: (1) Alcohol up to 10 per cent. has no influence whatever, and may be dispensed with in all cases where the dye is soluble in water; alcohol in larger proportion produces a distinct decrease in sensitiveness. (2) With a concentration of the dye up to 1:5000 the washing after immersion is quite unnecessary. (3) The preliminary bath may be omitted. It is further to be noticed that nothing is gained, at any rate with these three brands of plates, by increasing the concentration of the bath from 1 in 10,000 to 1 in 5,000. I believe, however, that with plates which have been prepared with hard gelatine or which have been treated with chrome alum, it is advisable to use the stronger bath, or to increase the time of immersion.

Ives' method consists in flooding the plate with an alcoholic solution of the dye (containing $\frac{1}{4}$ grain in 4 ounces), allowing the alcohol to evaporate, and then washing with water. It was not easy to see why this method should give better results than simply immersing the plate in an aqueous solution of the dye. Photometric experiments confirm this supposition. They also confirm Ives' statement that if the plate is treated with the strong alcoholic solution and not washed no sensitiveness to the less refrangible rays is obtained, doubtless because the alcoholic solution does not really penetrate the film. I was unable to get satisfactory results with cyanin in this way. I observed also that some films showed a great tendency to leave the glass altogether, a result due to the contractile influence of the alcohol.

Abney's method of sensitizing by means of a collodion or varnish film has completely failed in my hands.

It appears, then, that the best results are obtained in the simplest way. Dust the plate, immerse it for two or three minutes in a solution containing—

Dye solution (1:1000)	1-2 parts.
Ammonia (10 per cent.)	1 part.*
Water	8 parts.

* I believe I ought to point out that the use of an eosin dye with ammonia in this way is covered by Tailfer's patent. The ammonia may be left out if erythrosin or rose Bengal is used, but five or six times the exposure will be required.

Allow the plate to drain for some time, place the lower edge on blotting-paper in order to take off the ridge of liquid which collects there, and dry in the dark in a pure atmosphere. Develop in ruby light with a developer containing about 2 grains of sodium or potassium metasulphite per ounce, in order to keep the liquid clear, and thus enable the process to be more readily watched. As a rule, density is obtained more easily than with ordinary plates, and it is not necessary, and often not desirable, to have more than 1 grain of pyro in each fluid ounce.

(To be continued.)

[From the *British Journal of Photography*.]

PHOTO-MICROGRAPHY.

BY ADOLPH SCHULTZ, F. R. S. E., F. R. M. S.

[A Communication to the Glasgow Photographic Society.]

(Continued.)

REGARDING the necessary apparatus, the *microscope stand* claims first our attention. It need not be large and complicated, but it must be good; above all, it must be steady and free of tremor, as all vibrations imparted to the stand supporting the object will make themselves the more felt the more the object is magnified, and will result in a blurred image. The stand must possess a good and extra sensitive fine focusing adjustment, which keeps the objective strictly in the optical axis of the instrument, and does not move the image about in an eccentric fashion on the focusing screen. As regards the general plan on which an instrument for photo-micrography should be built, I consider it most desirable that it should be built on the old Ross or crane-arm model as far as the support of its body or optical tube is concerned, because you can then replace the ordinary single or the binocular body by a short or a long body tube of about two inches in diameter, which prevents the projection of a luminous flare spot in the middle of the light sensitive plate, and which flare spot is caused by the internal reflection of the narrow body tube, and is generally not much noticeable on the screen. All microscopes are provided with one or two mirrors; in the latter case, one is plane, the other concave, but in photography it is generally preferable to use the light direct. A diaphragm, *i. e.*, a plate pierced with a series of holes of different sizes, or an iris diaphragm, is an indispensable adjunct of a microscope, as it enables us in many cases to give sharpness or depth to the image by stopping down the angle of the illuminating cone of light, provided always that in doing so we do not sacrifice the amount of resolving power requisite for the display of the structure of the microscopical object.

The mechanical and concentric rotating stage is a luxury if it is of the best possible workmanship, but an inferior mechanical stage is an abomination to which a substantial plain stage is infinitely to be preferred. In order to display successfully the delicate structures of microscopical objects, we must have recourse to all the refinements of illumination which we can command, and we must bear in mind the intensity of the illumination of the image projected on the focusing screen decreases in inverse ratio with the superficial magnification of the object. Thus, if we magnify an object 1,000 diameters, or one million times superficially, the intensity of the illumination of the image on the focusing screen or on the sensitive plate is only the one-millionth part of the intensity of the illumination of the object itself, and from this we have further to deduct the

losses which the light suffers through absorption and reflection in passing through the lenses of the microscope. In order to increase the intensity of the illumination of the object, we require to make use of various appliances which serve for the concentration of a greater quantity of light on it than what it would receive without these appliances, and which are termed condensers and reflectors. The simplest condenser is the stand or bull's-eye condenser; generally a plano-convex lens of large diameter, and sometimes a Herschellian condenser, which is composed of two such lenses, and which arrangement is capable of giving a larger and flatter illuminated field than the single lens. The stand condenser is an indispensable and most useful piece of apparatus, and if properly understood can be turned to excellent account. By its means we are enabled either to fill out the aperture of a low-power objective with light, or to focus an intense bright and sharp image of the source of light on the object, which is one of the axioms of microscopical illumination under medium and high powers. For these latter, achromatic substage condensers are required which project an illuminating cone of great angular aperture on the object. They consist generally of two or three plano-convex superimposed lenses, and one or two diaphragm discs, the one containing a number of apertures, sometimes from the $\frac{1}{80}$ th of an inch in diameter, as in Powell and Lealand's condenser, to the full size of the anterior lens. The second diaphragm contains various central spots to produce dark-ground illumination, and a number of single or double slots, so as to give only marginal or oblique light from one or two directions. Some of these condensers, such as Abbé's, as well as certain specially constructed condensers for the use of immersion objectives, the nature of which I shall explain later on, require to be united with the under side of the object carrier or slide by means of a drop of fluid of far higher refractive power than air, such as water, glycerine, fennel oil, cedar-wood oil, etc.

Apart from these achromatic condensers, we have diffusion condensers for low powers and dark-ground condensers—such as the spot lens, the dry and immersion paraboloids, Wenham's reflex illuminator, etc., which make transparent objects mounted on transparent ground appear brilliantly illuminated by reflected light, leaving the ground quite black. The principle of dark ground illumination is to send the light rays so obliquely on the object that in passing through it they do not enter the front lens of the objective, but pass on beyond it. In this way only rays which are reflected from the irregular surface of the object itself reach the objective, all axial illuminating pencils being stopped off.

Correct microscopical illumination depends, first of all, upon the choice of the illuminator, and, secondly, upon its proper adjustment and focus, and, also, upon the relation of the aperture of condenser to that of the objective, the rule being that the aperture of the condenser ought to be the same as that of the objective, if we wish to obtain critical images.

The micro-polariscope is an accessory which serves to illuminate objects by polarized light, and is especially useful for differentiating the structure of certain classes of microscopical objects. It consists in its usual form of two prisms of Iceland spar, of which the larger one is called the polarizer. The polarizer is always placed below the object to be examined, whilst the smaller prism, termed the analyzer, is placed above the object, either between the objective and the body of the microscope or above the eyepiece. In the latter position of the analyzer, the definition is better than in the former, but it cuts off two segments

of the field of view. Both polarizer and analyzer must be capable of rotation round the optic axis of the instrument.

Opaque objects may be illuminated by the bull's-eye condenser, by prisms, or by reflectors, which are generally made of so-called speculum metal. Such reflectors are the parabolic side reflector, the cylindrical reflector, and the Lieberkuhn. This latter is an appliance resembling in shape the mouthpiece of a trumpet; its parabolic surface is silvered and it slides over the objective, the focus of its parabolic surface coinciding with that of the objective and the position of the object on the stage. The Lieberkuhn has to be illumined by rays parallel to the optical axis, and the objects for it must be mounted, so that the light from the mirror can pass around them and fall on the silvered parabolic surface, from which it is reflected downwards on the object.

The compound microscope consists of objective and ocular or eyepiece, and the former is by far the most important and essential part of the instrument. Micro-objectives are achromatic combinations of lenses, because it is impossible to produce single lenses free from chromatic and spherical aberrations, which defects make themselves most felt in lenses of great apertures. Micro-objectives are designated by their focal lengths, expressed in inches and fractions of inches, or in millimeters; thus we speak of lenses of 4, 3, 2, 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{12}$, $\frac{1}{16}$, $\frac{1}{25}$ and $\frac{1}{50}$ inch focus, but these foci do not represent the actual foci or working distances, which are far shorter, but they represent the focal lengths of single lenses having the same magnifications as these compound systems—in other words, these figures represent the equivalent focal lengths of single lenses. A micro-objective possesses certain qualities in a greater or less degree. There is, first of all, the defining power or definition, by which is meant the completeness of its corrections for spherical and chromatic aberration, which quality is easiest attained in lenses of moderate aperture. The flatness of the field of an objective enables us to see the central and the peripheral portions of the field simultaneously equally well defined. The penetration or penetrating power, which is called depth of focus in photographic lenses, enables us to see parts of an object lying in different planes well defined, and this without alteration of the focus. The penetrating power of a micro-objective is very limited, and becomes the more so the wider the angle, and consequently the greater the resolving power. This want of penetrating power is the weak point of a photo-micrograph, because only one plane of the object is in focus. The penetrating power decreases in inverse ratio with the aperture of a lens. One of the most valuable properties of a lens is the resolving power, by which closely approximated structural details and surface markings, such as lines, gratings, dots and apertures, are separately discerned or optically resolved. The resolving power, proper corrections of the lens granted, depends upon the angular aperture of the objective, or upon its capacity of collecting oblique image-forming rays proceeding from the object, provided always that these rays pass through the object glass and assist in forming the image. Hence opticians strive to make micro-objectives with as wide apertures as possible, the largest in air being obviously 180 degrees. Not content with this, they are supplying immersion objectives, whose front lenses have to be immersed in a drop of water, glycerine or oil placed on the thin glass covering the object.

(To be continued.)

A dancing master when angry must be "hopping mad."

FALL EXHIBITION OF THE SOCIETY OF AMATEUR PHOTOGRAPHERS.

As the exhibition of prints held at the rooms of this Society last year was so successful, the Board of Directors has decided to hold a similar one this year, beginning about the first day of November. The exhibition will be confined to the work of members of the Society, and it is requested that each member exhibit; those who will do so are asked to fill out the regular form and return it to the Secretary.

It is very desirable that all exhibits be framed, and distinctly marked with the name of the exhibitor. Circulars will be sent to members informing them of the time of the exhibition, when the exhibits must be sent in, and giving other information. Forms can be obtained from:

H. T. DUFFIELD,

Secretary,

122 West 36th Street, New York.

OUR ILLUSTRATION.

THE frontispiece of this issue of the BULLETIN is from the studio of Mr. G. G. Rockwood, of New York. It is one of his many happy studies with children. With an artist's eye, and a keen sense of humor, Mr. Rockwood has made a picture that fixes the attention of the observer at once, and the childish fun in the little subject grows upon one as we study the impression before us. She evidently enjoys the idea and is caught in her happiest pose. The picture is copyrighted, and is an excellent genre study.

THE EXHIBIT OF APPARATUS AT BOSTON.

THIRD NOTICE.

B. FRENCH & Co., of Boston, had one of the best exhibits of lenses in the convention. These embraced the new quick wide angle single landscape lens of Voigtländer, in all sizes, together with a variety of Darlot lenses. But the most important and novel exhibit of these gentlemen was a rapid, wide angle euryscope. This a new group lens made by Voigtländer from the celebrated optical glass of Jena, Germany. The angle of the lens is about 80 degrees, and the ratio of aperture to focal length is about 1 to 6, making it available for groups in short studios. It can also be used for outdoor work in confined situations. We are glad to note that photographic opticians are using the new developments of science.

C. H. Codman & Co., of Boston, had only a few exhibits; but Mr. W. H. Robey was present to see all his friends. There was one fine piece of apparatus in their collection that is certainly one of the most novel and useful improvements we have seen for a long time—we refer to the Centennial Camera Stand. The construction is very simple and consequently not easily put out of order. A table to carry the camera box slides between two wooden upright guides, giving a range of height from about 4 feet to within 6 inches of the floor. This table can also be tilted forward or backward at will. All the adjustments are so arranged as to be rigidly fixed when placed in position, and a solid iron base on three rollers gives a very firm foundation to the whole apparatus.

The Scovill & Adams Company had their usual display of apparatus, cameras, etc.

The display of the Acme Burnisher Company showed care in preparation and taste in arrangement. The diploma and medal of superiority awarded to this company by the American Institute occupied a conspicuous position. This enterprising company, feeling the necessity for a Rotary Burnisher, had on exhibition the latest improved Rotary Burnisher, which is called the Acme Rotary.

This burnisher embodies many new features, and with the direct heating principle, seems worthy of an extensive sale. The Souvenir Note Books given away to the Fraternity, with an elegant cut of the burnisher on them, were much admired and considered by all a model of neatness and beauty.

Allen Bros., represented by Mr. Orville C. Ollen, of Detroit, exhibited the Suter lens, and samples of work done by Guerin, St. Louis; Dabbs, Pittsburgh; Brush, Minneapolis; McMichael, Buffalo; Byarlay, St. Joseph, Mo.; Young, Oakland, Cal.; Cramer, St. Louis; Leigh, Beaver Falls, Pa., and others.

Wilson-Hood-Cheyney Co., Limited, of Philadelphia, had an attractive display, showing Osborne's accessories and backgrounds. Also new and beautiful designs in draperies, rugs, etc. They also showed a novelty in English and German border negatives, Japanese tissues, camera lenses, shutters, etc. The firm was represented by Mr. John G. Hood, assisted by Mr. Alfred Bennett.

George Heyn, of Omaha, Neb., had an advertising novelty in the shape of a three-sheet full colored lithograph representing a group of babies in pleasing variety. They are designed especially for photographers and are intended to be displayed on bill boards, the same as theatrical work. They are especially useful when large gatherings such as fairs, exhibitions, etc., are in progress.

J. C. Somerville, of St. Louis, had a handsome display of 18 x 22 photographs made with his new lens. The pictures were good and speak well for the lens.

Wing & Co., Charlestown, Mass., exhibited their multiplying camera, also a metallic plate holder, and a ball and socket lens holder. An old daguerreotype outfit used by Mr. S. Wing about 1850, was exhibited and explained by him in person. The relics were very interesting and attracted a number of visitors to his display.

G. Gennert, of New York, had a display of Eagle Albumen Paper, Byk's pyrogallol and hydroquinone, Boehmke lenses, and a new detective camera, the Montauk, whose merits we were unable to examine at the time of our visit to his display.

The Eastman Dry Plate and Film Company had a large display of Kodak cameras, together with some prints made from their new flexible films. They also had some fine examples of enlargements upon their bromide paper. Roll holders with recent improvements were also shown, making the model much lighter than the old form.

George Murphy, of New York, had quite an extensive display of apparatus and accessories of various kinds. Shutters, print cutters, the Ross burnisher, flower scrolls, Eagle camera boxes and lenses, new curtains and new floor-cloths. The display was neatly arranged and under the personal supervision of Mr. Murphy.

James E. Knapp, of Jersey City, had a full display of his "oil painted" photographic accessories in papier maché. The chief advantage claimed for these is that they can be readily stowed away.

C. A. Schindler, of West Hoboken, N. J., had a display of photographic furniture for studios and reception-rooms. Some of the designs were very artistic.

The exhibit of J. A. Knorr, of New York, comprised an assortment of German photographic mounts, celebrated for their high enamel and the originality of designs used in lithographing them. He also exhibited a complete series of papier maché trays used for developing, silvering and toning.

Packard Bros., of Roslindale, Boston, Mass., had 1,000 square feet of space covered with backgrounds and accessories. The 5 x 8 feet and 6 x 8 feet backgrounds for children and adults were much admired. Their flower pots, daisy-fields and bramble foregrounds made a beautiful display, and arranged in conjunction with papier maché accessories, set slips and rustic work, made a very attractive exhibit. The firm also exhibited a full line of draperies, Japanese goods and ornamental furniture for operating and reception-room.

The Schultze Photo Equipment Company had a neat and interesting display of apparatus. Rectiscope lenses, ruby lamps, and pictures made on the "Star" albumen paper were among the more prominent things exhibited.

Barker & Starbird, of Boston, also had a small but well arranged exhibit. Some new lenses, called the "Eurygraph," were exhibited, with both long and short focii. Also yet another detective camera called the Bromfield, fitted with a Lyndon shutter and double spirit levels. They also showed a number of amateur outfits called the "Superb."

There were other exhibits of more or less interest, but important material calls for us to close our review of one of the best exhibitions of photographic apparatus it has been our good fortune to examine.

MORE GOOD WORDS FOR "THE INTERNATIONAL ANNUAL."

The second issue of this new annual is fully equal in interest and quality to the initial work published in 1888. It contains eight illustrations by different processes. In addition to these attractive illustrations, there are many interesting and useful articles on subjects of special value to amateur and professional photographers. "Blue printing," with formulas and illustrations of apparatus for carrying it on, on an extended scale, is very comprehensively treated by C. B. Talbot. There are several articles on the new hydroquinone developer and how to use it, the making of window transparencies and lantern slides, some conveniences for the amateur, orthochromatic photography, photographic emulsions and machinery for making them, the uses and development of gelatino-bromide paper, hints in photo-micrography, and many useful tables and formulas. It is a mirror of the latest experiences and progress of the science of photography, and should be in the hands of every progressive photographer.—*Scientific American*.

The first "International Annual," issued last year, was such a magnificent production that we fully expected the second volume to show a falling off in value. Evidently the publishers had no such intention, for this year they have achieved the feat of beating their own record, and beating it very thoroughly. The illustrations are far ahead of anything given in photographic literature before. Two views of the same scene, taken from the same point, one with a wide-angle and the other with a narrow-angle lens, will be useful as a practical demonstration of the difference in effect, and should also prove valuable as a striking object-lesson in "composition." "A Study," by Falk, printed in aristotype, is well worth many a careful scrutiny; and a portrait of Miss Lillian Seccombe, printed in photophane from a negative by Harold Baker, of Birmingham, is an exquisite lesson in pose and lighting. Both these pictures are notable for the arrangement and reproduction of white drapery. A picture in Leimtype, by Husnik, of Prague, which might almost be called "a vision of wavy hair;" surf breaking on Newport Rocks; two views in the Tyrolese Alps; Lulu, a child study, and a "half-tone" engraving, complete the list of full-page illustrations, but there are also numerous wood-cuts in the text. As regards the literary fare provided by our friend, Mr. W. Jerome Harrison, and his associate, Dr. Elliott, we may say that it is similar in general character and arrangement to the matter found in our English Year-book and Almanack, but somewhat brighter and more lively, owing perhaps to the infusion of American blood. Altogether, the "International" is an annual that no photographer can afford to be without.—*Photographers' World*.

to say that I look upon the office of Secretary as one of the most important offices that we have in connection with the Association. I think it is quite as important an office as that of the President, and probably more so in some respects. Largely does the success of the organization depend upon the work done by the Secretary. He must be a man of great executive ability, to begin with. He must be a man who is a worker and a man who will devote largely his time to the work of the Association. He has to write a good many letters. He has to make close calculation, and to his energies we are largely indebted for the number of exhibits that are brought here, as well as the number of people who attend the Convention. I think myself that the name of the regular nominee is the name of a man who has that ability, and I would be glad to see a unanimous ballot cast for him. I think he has done a noble work for the Association. He was Secretary when the Association was on a very low basis. He raised it to a level which we all know was a high one, not only giving us fine exhibits, but leaving a large balance in the treasury, as we have been informed from the stand. He has acted in the capacity of President and has filled the chair well. I hope you will give Mr. McMichael, our President, who is the regular nominee of the committee, a unanimous vote. (Applause.)

Mr. BARKER—For the office of Secretary of the Association for the ensuing year I wish to ask your kind consideration of the name of Mr. C. H. Stoddard, of Erie, Pennsylvania.

Mr. CROUGHTON—As the officers, so far, seem to be concentrated in the eastern part of the State, I would like to nominate a gentleman further west, a gentleman who has been known for many years as an exhibitor and a good worker. And I think he is better known among the generality of the members than to myself. I allude to D. R. Coover, of Iowa City.

A Member—I want to nominate Mr. L. C. Overpeck, of Hamilton.

The President—For about five or six years I have been a member of the Association. Most of that time I have been at work for the Association. I have had all the honor conferred upon me that I could possibly have. I have done the very best that I could. I have had all the honors conferred upon me that possibly could be in the way of prizes and awards, having won ten national and one world's prize in the last four years. Now,

ladies and gentlemen, I wish to retire and give the rest a chance. I am perfectly willing that anybody should have the office of Secretary. There is plenty of work in it. You will find that there is a great deal to do. There is a great deal to attend to. You have my consent to put anybody in that you like. I do not wish to run again.

Mr. GLINES—I move that the nominations be closed.

(Motion carried.)

The Convention then proceeded to ballot for the three nominees, C. H. Stoddard, D. R. Coover and L. C. Overpeck.

The President—While they are collecting the ballots, Mr. Stanton would like to say a few words about the Convention in Canada. He is the President of the Canadian Association.

Mr. STANTON—*Gentlemen of the Photographers' Association of America*,—I assure you that I have spent the last few days that I have been here with a great deal of pleasure to myself. I have had great pleasure in meeting many new and renewing many old associations. I have been in photography for thirty-four years. I left Canada when I was a daguerreotypist, came to the United States, went to Virginia, and made the first photograph in the State of West Virginia, in the gallery of A. C. Partridge. I remained in the State of Virginia for a number of years. I went to Canada after the first year of your late unpleasantness, your war. I returned to this country later, went to Baltimore, and did business there from 1864 to 1871, at the corner of Fayette and Charles streets. The firm was known as Stanton & Blake. After that family matters carried me back to Canada, and I have been located since then in Toronto. I only tell you this that you may know that I am somewhat connected with the American people. My father was born in Canada in 1801. My grandfather, a native of Stonington, Connecticut, went, in 1774, to Canada. My mother's people were from New England. I feel myself at home in the City of Boston and in the State of Massachusetts. I have learned to love the American people as I love my own people. I feel, as I have said, thoroughly at home. I am drifting a little from what I had intended to say. I am in no sense a public speaker. As President of the Canadian Association I give you a cordial invitation, and in the name of the Association, to visit Canada when we have our Convention on the 20th, 21st and 22d of this month. We do not expect to have as many there as we

have here. We are a smaller people. You are sixty millions of people. We, probably, five millions. We get together, there, about one hundred photographers, earnest, energetic men, glad to learn, and who would be glad to learn of you. They would be glad to have exhibits from you. Some few have promised Mr. Dixon and myself that they will send exhibits. If they will, we will gladly pay the expenses. And they will be carefully cared for, and as carefully returned, free of expense, to the party that may send them to us. (Applause.) Will some of you who have fine exhibits kindly send them on? We trust that all who can will visit our country, and I promise you a right royal welcome. The City of Toronto is a beautiful city. It is a city very much like your American city of Detroit. You will be pleased with it. You will find there works of art worthy for your eyes to feast upon. You will find statuary; and in the museum and the educational departments you will find sufficient to pay you for the trip. You will find that building known as Toronto University one of the finest, if not the finest, pieces of architecture on the continent of America. I speak knowing that I have that opinion from many of your Americans who have visited that country. You will find the same energy enters into the people there which characterizes your people here. You will find there a great love for the American people. If you come there when we have our celebrations, you will find the Stars and Stripes mingled with the Union Jack. (Great applause.) I have nothing more to say, but give you a hearty welcome to Canada. (Great applause.)

The *President*—The ballot for Secretary stands as follows: Mr. Coover, 53; Mr. Overpeck, 21; Mr. Stoddard, 19. Is Mr. Coover in the audience? (Mr. Coover comes forward.) Mr. Coover the Photographers' Association of America have elected you as their Secretary. Will you accept the office?

D. RAD COOVER—I will. I thank you for the honor bestowed upon me. I will do all in my power to make the Convention of next year as successful as the previous ones have been.

The *President*—Nominations for Treasurer are now in order.

Mr. RANGER—I move that the Secretary of the Association be authorized to prepare and cast a ballot bearing the name of G. M. Carlisle for our Treasurer.

(Motion carried unanimously.)

Mr. PICKERELL—Mr. President, I move you that we adjourn until four o'clock.

(Motion carried.)

Seventh Session.

BOSTON, August 9, 1889, 4 P. M.

The *President*—We will open this meeting, beginning under the head of new business. If any one has anything to offer we will consider it now.

Mr. MOTES (of Atlanta, Ga.)—There is one matter which has been overlooked or forgotten in some way. That is, in reference to this beautiful banner, which was originally prepared and given to the Association by Mrs. Clark. It has recently been overhauled and renewed and additions made to it, and has been presented to the Association. I therefore move a vote of thanks to Mr. and Mrs. Clark for this beautiful banner. I will say, in addition, that the picture of Daguerre has been put upon it, with others. They have gone to a considerable expense to make this banner, and have presented it, in this beautiful style and shape, to the Association.

(Motion carried.)

Mr. APPLETON—I move that a vote of thanks be extended to Mr. Benjamin French, for the very kind reception he has given us in opening his house to us as a society.

(Motion carried.)

Mr. APPLETON—I will make a motion that a vote of thanks be extended to the Press of Boston for the very kind attention they have given us during this Convention.

(Motion carried.)

A *Member*—I wish to propose a vote of thanks to the officers of the Association, for the very successful manner in which they have carried out this Convention and the exhibition.

(Question put by the mover and carried.)

Mr. APPLETON—Mr. President, I move you that there be an appropriation made of \$1,000 for awards for next year.

(Motion seconded and carried.)

Mr. RANGER—I wish to offer a vote of thanks to the President of the Canadian Association and to Mr. Dixon, for their kind invitation to the Canadian Association. I think we should recognize the fact that they are here, and extend a vote of thanks to them for their invitation.

(Motion seconded and carried.)

Mr. AUSTIN—I would like to know, sir, if any provision has been made for instruction at the next Convention? It is a matter of much disappointment to me that there has been no instruction on this occasion. I came here thinking I should get a great deal of information from the platform. I have got a vast amount, certainly, from the exhibit, but I expected something more.

The *President*—Were you not here last evening and the evening before?

Mr. AUSTIN—Yes, sir; but I anticipated something from Dr. Wilson.

The *President*—We were disappointed in

that. I did recommend that we appropriate \$500 for next year.

Mr. AUSTIN—Then cannot I make a motion that we appropriate \$500 for that purpose for next year?

(Motion lost.)

Mr. DECKER—I move that the Executive Committee be authorized to expend any reasonable sum for the purpose of having lectures and instruction. Then they can act as they choose. They can pay money or not.

The President—That is already in their power.

While we are waiting for the announcement of awards, I think we shall be glad to hear from two or three of our friends. Here is Mr. Long, sitting in the front seat. We would like to have him stand up, so that we can look at him. I believe he has been in the business ever since the time when there wasn't any business.

Mr. RANGER—I also see Mr. Southworth, who made daguerreotypes with Professor Morse in 1839 and 1840. I wish the President of the Association would present him as the pioneer of photography.

Mr. LONG—As you asked me how long I have been in the business, I would say I commenced in July, 1842. Then we had nothing but daguerreotypes, of course, and only one size—the one-sixth size; and only one kind of a case—a silk lined case. And the only question to ask a man was how much of him you wanted to show. (Laughter.)

The President—*Ladies and Gentlemen*,—Allow me to present to you Mr. Southworth, one of the old veteran photographers. (Great applause.)

Mr. SOUTHWORTH—Some old orator said that it was easier to begin than to leave off, and I am afraid it is easier for me to begin than it will be to leave off; but I will try to overcome that. In the winter of 1839 and 1840, immediately after Professor Morse arrived in New York, I went on to New York, at the request of Mr. Joseph Pennell, who was then doing some work in Professor Morse's rooms. He was an old school-mate of mine, and I commenced making daguerreotypes; and we did the best we could. He stayed with me three or four years, and then came to Boston, in 1841, and I kept on until 1861. I will simply say now that I was called to go out to Wilburham in the summer of 1840, just to tell them how it was done. I went there, and as I stood before the students, just on my right hand there was a sofa with six or eight persons sitting on it. And I said: "The time is coming when we will make as many likenesses upon a plate as there are people on that sofa, and the time is coming when every hair of a race horse going at 2.40 can be taken." (Applause.) My anticipations, my imaginations, could not come up to what I see here in this hall. I should not take up your time. You will find some of my experience in the books, and you will find in Mr. Wilson's book a short address of mine which is as good as any that I could make now. I am glad to meet you, glad to see the progress you are making in our art, in the art to which we have devoted our lives and our best exertions. And it does not seem, when we stop to think of it,

it does not seem as if we could get much farther.

I wish you all a pleasant remaining time here, a happy journey to your homes, success in your business, and a happy hereafter. (Applause.)

The President—*Ladies and Gentlemen*.—Here is Mr. G. H. Loomis, of Boston. I take great pleasure in introducing him.

Mr. LOOMIS—I am here at the solicitation of some of the gentlemen who have an official connection with this Association, simply to show me off, an instantaneous view; but I have been taken for some time, and the print is rather faded.

Mr. CRAMER—It will tone you up.

Mr. LOOMIS—It is an extreme gratification to me to be present. I have come one hundred miles to see the faces of the living as well as all that have been typified by art. I find some of them here, thank the Lord, and thank them also. They are here, but only a few. Twenty years ago—I had then but just commenced business four or five years; I am not a veteran, exactly—we thought it would be a very nice thing if we could have an organization in photography. We thought we might as well meet with each other, as you are doing now, and it was my pleasure, with my friend Bogardus and several others, some of whom are not here to day, to meet in New York. And there it was that I gave them a cordial invitation to visit the Hub, which, I think, was in the year 1869—that is twenty years ago. And they came. They came in force. They came and brought their beautiful work. It was beautiful for that time. It was elegant, it was splendid. But, as I have remarked recently in print, the fourth-rate efforts of the artists to-day excel the first quality of the exhibits in that Convention. Such rapid strides, such a wonderful advancement, has never been known in any other department of art or industry that I know of, and I have examined pretty carefully. I think, photographers of the United States, that you are to be congratulated as having outrun almost everything else in the way of discovery and improvement. (Applause.) And I say to you now that you are doing the best thing that you can do. You are making the best investment that you can make in coming to this Convention; and if I was in your place, I would not wait for the Convention; I would visit my brother photographers in the various cities of the Union at every opportunity and every time I could get a cent to go with. You can, in that way, get more information than you can while performing the humdrum duties of daily life. You are, most of you, in dark closets, perhaps. You must come out as often as you can, and you will find every time you make one of these visits you will be amply paid.

I remember, some years ago, when I was in business, of going through the cities of the Union. I made the trip because I thought it would pay, and it did. I used to come home perfectly hating myself for doing such poor work; and I was glad my constituents, my customers, had not been where I had, because they would have turned me out of town. I tried to forget it, but I did not forget to go on.

and do my best in the way of improvement. Then, again, we have had all those suits, those processes and those patents. In my day I was one of those engaged in the warfare against re-issues of old, dried-up patents. We had them to fight tooth and nail. I am not saying a word against the inventors. But the warfare is dropped, substantially, and the glorious good time of fellowship has come among photographers.

Ladies and gentlemen, I thank you for the opportunity of showing myself. "That will do." (Laughter and applause.)

The *President*—The Secretary will now read the awards.

The list of awards was read by *Secretary* SCOTT.

President McMICHAEL—*Ladies and Gentlemen*,—I thank you all for your kind attention and courtesy during my term of office and during all the meetings here. We will now close, to meet in Washington next year.

THE CHICAGO CAMERA CLUB.

A SPECIAL meeting of the Chicago Camera Club was held at the club rooms, Tuesday evening, September 24th. A large number of the members were present, attracted by the announcement of an address upon the construction and use of photographic lenses by the well-known optician, Mr. W. Drescher, of the Baush & Lomb Optical Company, of Rochester, N. Y. Samples of the new Clark lens, which this company are now getting ready for the market, were shown, and also their recent improvements in diaphragm shutters. Speaking of the Clark lens, Mr. Drescher said: "They are the invention of Mr. Alvan G. Clark, the celebrated manufacturer of telescopes, and are dissimilar from anything heretofore followed, and are as striking in their results as Mr. Clark's success in the telescope objectives has been. While these lenses are of the ordinary rapid rectilinear type, they are really wide angle, embracing an angle of 100 degrees, but are dissimilar from other lenses of this character in so far that they work with full aperture. They are almost free from spherical aberration, and cover their respective plates better than any lenses yet produced specially for this work. The lenses are uncemented, each lens of the combination being mounted for itself, and are therefore free from danger of gradual decrease in speed so common in many lenses, owing to the chemical change in the cement. The crown glass is on the outside, and therefore less liable to become scratched. The mountings are unusually compact. While these lenses are intended to be used in all out-door work, they are also particularly suited to copying, enlarging and photo-engraving work, and are, as

well, superb for portraiture, particularly for groups. They all work with stop $f/7$, and are therefore adapted for all work requiring speed."

On Tuesday evening, October 1st, another special meeting of the Club was held, to give the members an opportunity to meet Mr. John Carbutt, the veteran dry plate maker, who was making a short visit in Chicago. The rooms were crowded to the doors. After the transaction of some regular business, Mr. Carbutt was introduced and made a very interesting address upon dry plates, ortho-chromatic plates and films, their history and manufacture. He also showed several negatives and prints illustrating his remarks, including the first negative which he ever made.

Dr. Nicol related the result of his experiments with camphor in the developer, and decided that even in large quantities it did no harm. This investigation was brought about by the inquiry of several members, who had noticed the strong odor of camphor in the new transparent films.

The Secretary gave the summary of his investigations with "Nuktigonia," which were not very flattering, it being simply a coloring matter placed in the developer, and an old idea revived. Extraordinary precautions must be observed in using it, and it quadruples the cost of the developer, so the conclusion was that the dark room lantern was still the best device.

FRED. K. MORRILL,

Secretary.

ST. LOUIS CAMERA CLUB.

A MEETING of the St. Louis Camera Club, held September 17th, was called to order by *President* BAIN at 8.30 P.M., with twenty-one members present.

The minutes of the last regular meeting, and also of two special meetings held since, were read and approved as read.

A report from the Membership Committee, recommending the election of Mr. A. H. Zeller, was received. After balloting he was declared unanimously elected an active member of the Club.

An application for active membership from Mr. Julian Laughlin was read and referred.

The Chairman of the Lantern Slide Committee requested that the slides for this season's interchange be sent in as early as possible so that a good collection can be selected; also to be careful in making the mats for the slides.

Mr. C. H. Holland moved that the dues be raised to \$3 per quarter, and that the initiation fee be \$3.

Motion carried.

Mr. Butler moved that the Executive Committee make a report at next meeting as to the probable cost of fitting up a dark room.

Motion carried.

The resignation of Mr. W. M. Butler as Secretary of the Club was accepted.

Upon motion of Mr. Kilgen a vote of thanks was tendered Mr. Butler for his long and faithful service in the interest of the Club.

Upon motion, meeting adjourned at 10.10 P.M.

W. M. BUTLER,

Secretary.

LYNN CAMERA CLUB.

A SPECIAL meeting of the Lynn Camera Club was held on Friday evening, October 4th, with a good attendance. The plans of the new club-house were accepted, and it was decided to use the incandescent system in lighting. Application for active membership were received from Guy C. Hovey, 48 High Rock avenue; E. P. Michaels, 30 Brownville avenue; Otis K. Stuart, Boscobel; Stephen F. Breed, 9 Portland street, and an application for transfer from associate to active membership was received from W. A. Porter, of Beverly.

Work has commenced on the new club-house for the use of the Lynn Camera Club. This building is to be 30x40 feet, two stories, flat roof, second story to be fitted for use of the club, with 8x14 feet sky and side light, and a fine dark room, which will be about 15x20 feet. The large hall, with screen for slide exhibition, will contain about 900 square feet, and easily accommodate one hundred persons. The building is being erected by N. J. Bacheller, at 42 Broad street, and will face toward and about 60 feet from the street. The plan was prepared by E. L. Rogers, a member of the club, with special reference to the comfort and convenience of the members. The dark room will be fitted with lockers for use of the members, and those desiring one will do well to make application to the treasurer at once. The committee are now ready to receive applications for membership, to date from November 1st, and all interested in the art of photography are invited to join and have the benefit of the use of the rooms and instruction to be derived from attendance at the meetings and demonstrations.

Amateurs are requested to make application to any member of the Club, or to the following Membership Committee: W. H. Drew, E. F. Bacheller, W. H. Russell.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—G. Bros. writes: Will you be so kind as to inform us through your BULLETIN what is used for blackening the stops of lens when they become worn?

A.—Mix lamp-black into a stiff paste with gold size, using as little of the latter as possible. Then add turpentine to thin out to suit, and brush on the stops. Another way is to clean the stops from grease by washing in hot soda solution, and then immerse them in potassium sulphide or ammonium sulphide. After thorough washing, this latter treatment gives a dead black coating, and is the method that we prefer.

Q.—S. L. S. S. writes: I have one of McAllister's largest magic lanterns, and in using it, I notice the middle or center of the picture is sharply defined, but the edges dull or foggy—I suppose it is the lens. Will you please tell me what make or kind of lens will give a sharper or better defined view out to the very edges?

A.—The lack of definition is due to some defect in the lens. Perhaps the lenses have been removed for cleaning and then replaced in the wrong position. The regular E. A. portrait lenses are suitable for magic lantern work, and give good definition.

Q.—W. A. writes: Has the cause of yellow spots like enclosed yet been discovered? What is the difference between absolute wood alcohol and other alcohol in strength properties, etc.? What test is there to denote the presence and amount of alcohol in solutions? What can be substituted for iodine (which is fugitive) for use in varnish?

A.—The yellow stains are due to imperfect fixing, too short a time in the hypo bath, and then imperfect washing. Wood alcohol is what chemists call methyl alcohol, and it is made absolute (that is free from water) by distilling it after allowing it to stand in contact with quick lime for many hours. Ordinary alcohol is made by fermentation of corn or other cereals. Wood alcohol is made by distilling wood at a low temperature. Absolute, means 100 per cent. Ordinary alcohol contains from 6 to 50 per cent. of water; the latter is spirit of wine. Hydrometer for liquids

lighter than water will give the specific gravity of alcohol, and a table giving the percentage of alcohol for any specific gravity can be found in the "International Annual." Try a little turmeric instead of iodine.

Q.—M. S. L. writes: I mail you to-day two prints of a young lady which were made last December. Will you be so kind as to tell me through the BULLETIN the cause of their fading?

A.—The cause of the fading of prints is not an easy one to ascertain; but we think that in the prints that you send it is due to light printing and insufficient toning.

Q.—R. B. L. writes: Will you kindly give me some information through "What Our Friends Would Like to Know" on a few points which I think will be gladly received by many amateurs, if not some professionals? I refer to the signification of the terms "back focus" and "equivalent focus." I have talked with several photographers on the subject, and, although they all had an idea, yet none could give an exact definition. If you will give me an idea of the meaning of the terms, and also the relation that they bear to the lens and the camera, you will greatly oblige.

A.—The term "back focus" is the distance from the rear combination of a double lens, or from the back of a single one to the ground glass when the lens is focused on distant objects. "Equivalent focus," with a single lens, is the same as back focus; in a combination it is practically the distance from the diaphragm slit in the lens to the ground glass when the lens is focused on distant objects.

Q.—J. G. encloses spotted print and writes: Inclosed you will find print with light spots, what is the cause and how can I remedy it? Please answer through the BULLETIN and greatly oblige.

A.—We think those markings are due to

the handling of the albumen paper with fingers having hyposulphite adhering to them, and moist with perspiration.

Views Caught with the Drop Shutter.

E. & H. T. ANTHONY & CO., our publishers, have just issued a new and handsome catalogue. It is a large octavo of about 150 pages, finely printed and illustrated with all the latest improvements in photographic apparatus. It is useless for us to enumerate the new things found in its pages, they are too many for this column. Get a new catalogue and see for yourselves.

POLLOCK & RIKER have opened a special laboratory for mercantile photographic work at 198 William street, New York, and make a specialty of photo-printing and bromide enlargements for amateurs.

WE regret to note that CHARLES S. CUDLIP, the well-known Washington photographer, died at his rooms at the St. James Hotel, in that city, on September 30th, from the effects of a succession of epileptic fits. Mr. Cudlip was forty-four years of age, and started in photographic work about fifteen years ago.

"HOW TO MAKE PHOTOGRAPHS," the little manual for amateurs, originally written by H. T. Anthony and T. C. Roche, has just been issued by the publishers of the BULLETIN in a new Third Edition, partly rewritten and brought down to date by Dr. A. H. Elliott, the associate editor of the BULLETIN. It is one of the best books for the beginner, the clear and simple style of the original authors being maintained in this new edition. A review of the book will appear later.

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BASIL, THE BLACKSMITH,
FROM LUGGELLW'S EVANGELINE.

PROCTER & GIBBS

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

OCTOBER 26, 1889.

Vol. XX.—No. 20.

THE AMERICAN INSTITUTE FAIR.

YEAR after year the authorities of the American Institute Fair have devoted considerable space and offered special inducements to photographers in and around New York city to make exhibits of their pictures. They have brought the exhibits from the rather inconvenient quarters upstairs to the more accessible and better arranged alcoves of the terrace around the main hall. They have carefully studied the draping of the walls to receive pictures, and have one of the best lighted series of spaces that we know of. Yet with all these inducements, how few of the photographers of this city and vicinity make an effort to exhibit their pictures. Dana, Rockwood, Pach, Fredricks, Perkinson and one or two others are about all that make a display of pictures every year from among the hundred of excellent artists in and around this city. The thousands of people that visit the Institute Fair every year are an audience that no photographer could hope to attract to his studio for the purpose of looking at pictures alone. These visitors to the Fair are attracted by the variety of exhibits, and it is certainly strange that photographers cannot see that it is to their interest to display their work in such a favorable situation. Various manufacturers of art and decorative materials make exhibits of their work and novelties from year to year, and from the space that they occupy they must find it advantageous to display their manufactures. Surely photography as an art is making sufficient progress to call forth a display of pictures that will prove attractive as an exhibition; and such a display of good work will inevitably educate the public to a higher level of appreciation of photography, at the same time encouraging the artists who have produced the pictures.

There is no doubt that the small sum charged for space by the Fair authorities is extremely moderate when we take into consideration that the exhibition is open for two months. A great many square feet of space can be covered with pictures that will cost less than fifty cents per day for rental, a figure that appears exceedingly small for the advantages offered.

For several years past we have seen a slight increase in the number of exhibitors and a very decided progress in the quality of the work exhibited; but why there are not more pictures and a high spirit of emulation among photog-

raphers in New York we are at a loss to understand. Some perhaps, will suggest that the present low figures of remuneration for photographic work prevents the artists from making exhibits. This can hardly be a good reason, for some of those that make displays at the Institute Fair year after year are men that make pictures (portraits) at the lowest rates. These must find it advantageous to make an exhibit, or they surely would not do it. Such artists as Dana, Rockwood and Pach. who command higher rates of remuneration, also exhibit year after year, and they are too good men of business to do so if it did not prove profitable to them.

We therefore urge upon the photographers of New York City, Brooklyn, Jersey City and other towns within easy range of the Institute to look into the matter, and let us have an exhibition of photographs that shall be a credit to them. We can think of many artists in and around this city who could make some extremely interesting displays of landscape, architectural, marine and other pictures that would not only be very attractive to the general public, but would at the same time educate them to a better appreciation of the art. The Institute Fair is now open for the season, and the stream of visitors is beginning to flow. Photographers for many miles around New York must have among their collections pictures of interest, and also of beauty, that would call attention to their work and the progress of the art. It will never do to sit still and let the people find you out; if you have any ambition let your work be seen, and rest assured merit will receive its reward. Painters and sculptors do not wait till visitors call at their studios; but they exhibit at any academy that will hang their pictures, and gladly pay for the opportunity. As photography is an art it should follow art methods in bringing its development before the public.

EDITORIAL NOTES.

WE hear that a new substitute for the ruby glass of the dark room lantern has been discovered. It consists of very thin sheets of young pine wood planed down as thin as veneers. The fact that the light transmitted by thin pine wood was of a beautiful red color was first brought to our notice by Professor Le Conte Stevens, of the Packer Institute, Brooklyn, a year or two ago, while standing in his lecture room with the pine shutters drawn to darken the room for some optical experiments. A beautiful rosy hue pervaded the room some distance from the shutters, and we should judge that the light would be suitable for the development of photographic negatives. It is now stated that the light is non-actinic and perfectly safe. The advantage of wood over glass is obvious.

SOME years ago Kühne, the eminent German physiologist, proved that the coloring matter of the retina of the eye was sensitive to light. We now learn that an English experimenter has made the discovery that, by looking at an incandescent electric light for some seconds, then shutting the eyes and going into a dark room, he can obtain a picture of the light by simply looking at a very sensitive gelatine dry plate and developing. If this is true, then it may be that the visual purple of Kühne stores up the light rays.

It is also reported from England that a chemist there has discovered a printing paper that gives black and white prints, using ammonia as a fixing agent. These prints are said to require no toning.

DALLMEYER, the great English optician, has brought out another new lens specially adapted to detective camera work. It covers a 4 x 5 plate, and is pronounced a pretty and very fine instrument by those who are good judges.

PROFESSOR S. W. BURNHAM, of the Lick Observatory, California, is going to South America to observe the total eclipse of the sun which occurs December 27th next. He takes with him a 6-inch telescope, and will doubtless obtain some interesting results if the weather permits.

THE United States war-ship Pensacola sailed from the Brooklyn Navy Yard on the morning of October 16th, bound for St. Paul de Loanda, on the West coast of Africa, and carrying a company of scientists sent by the United States Government to observe the total eclipse of the sun. Among those that form the party are L. H. Jacoby of the astronomical department of Columbia College, and Mr. Carbutt, the son of the veteran dry plate maker, of Philadelphia. That latter gentleman carries with him the apparatus used by his father on a similar expedition. We do not expect to see these gentlemen for five months; we hope they will have successful voyage and a safe return.

AMHERST College Camera Club has been organized with the following officers: *President*, R. B. Luddington; *Secretary*, H. N. Potter.

THE Springfield, Hartford and Albany Camera Clubs have joined the New England Lantern-Slide Interchange, which is composed of clubs organized in New England cities.

THE Yonkers Photographic Club have excellent quarters in the Deyo Building in that city, and opened the winter season with a lantern slide exhibition from negatives taken during the summer recess.

MR. WILLIAM G. REED, of the Boston Camera Club, writes that a "circuit" has been arranged for "Illustrated Boston" this winter, and sends us the following list of the cities where it will be exhibited: Providence, R. I., from October 12th to the 26th; Lowell, Mass., from October 26th to November 9th; Hartford, Conn., from November 9th to the 23d; Newark, N. J., from November 23d to December 7th; Baltimore, Md., December 7th to the 21st; New Orleans, La., December 21st to January 8th, 1890; Louisville, Ky., January 8th to the 25th; Cincinnati, O., January 25th to February 11th; Pittsburgh, Pa., February 11th to the 25th; Chicago, Ills. (Camera Club), February 25th to March 11th; Grand Rapids, Mich., March 11th to the 25th; Cleveland, O., March 25th to April 8th; Syracuse, N. Y., April 8th to the 22d; Albany, N. Y., April 22d to May 6th.

THE New York Camera Club held its first quarterly business meeting on October 9th, and a programme was arranged for a series of entertainments and meetings for the members during the coming winter. We hope at an early date to give the details.

THE Lowell Camera Club will hold a non-competitive exhibition of photographic work at Morrill's studio, Central Block, November 12th to 16th inclu-

sive. The Exhibition Committee are : William P. Atwood, H. W. Barnes, W. E. Badger, Charles Francis, and George A. Nelson, *Secretary*.

We also learn of the formation of the "Detroit Amateur Photographic Society." Organized October 1st. The following officers have been elected to continue in office until the January meeting : *President*, James Joy; *Vice-President*, H. L. Wilton; *Secretary*, Joseph E. Lockwood; *Treasurer*, D. Farrand Hanry.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

The Great Jubilee Exhibition at Berlin and what we can learn from it.—Eder's New Acid Hypo Bath.

The great jubilee exhibition in Berlin belongs to the past, and since 1865 it was the greatest show of its kind that has taken place here. The pictures covered more than 10,000 square feet. That the United States were honorably represented I have written to you already. Pickering Brothers, Jackson, of Denver, and Rowland, of Baltimore, obtained silver medals. Regarding the exhibition itself many interesting conclusions may be drawn from it. We are at a period of many new changes in photography, and new methods are more generally esteemed. I clip the following from the reports : First, the general increase of platinum prints.

Berlin portraitists have taken little notice of this yet, and, the fact is, almost only Berlin amateurs exhibited platinum portraits ; but it was much more decidedly represented by exhibitors from other cities. Bieber, in Hamburg, and Pietzner, in Teplitz ; Van Delden, in Breslau ; Selle & Kuntze, in Potsdam ; and in England, Winter, Sutcliffe and Chamberlain. Pietzner proves by his silver prints, exhibited at the same time, that with regard to attraction the platinum print is not the least behind the silver print, but the contrary is the case. We have always spoken in favor of this new and durable process. The exhibition has cleared the way for this work.

In England, the mother country of the platinum print, it has become more domesticated than with us.

In reproductions the platinum print had only one representative, Dr. Albert, of Munich, which is rather astonishing, as Albert's results are actually wonderful, the platinum picture resembling greatly in richness of tone and color the photogravure which is generally considered as the finest art-reproduction-process. Some were very likely still more surprised to find the pigment (carbon) print, which had been abandoned by many, and is at most applied now only for diapositives, to be represented in a pretty prominent manner.

Here may be mentioned, before all, the magnificent reproductions of Hanfstaengl, which rank first in artistic superiority. In size they are surpassed by the large folios of Koch in Neuwied, who applies pigment printing most strongly for enlargements, and has gained renown by his exhibit, the pictures showing however rather too much retouching. But amateurs also are zealous admirers of pigment printing. Wonderful landscapes, particularly some magnificent winter scenes were exhibited by Sacré, in Geneva; further by Scholtz, in Gorlitz; Clement, in Yorkshire, and E. Vogel, Jr.

The carbon print in comparison with the platinum print has the advantage of its manifold tones; but notwithstanding all its accomplishments we do not care to give it the preference. Chemically the carbon print is just as durable as the platinum print, but the former can more easily be damaged mechanically.

Surprising, also, in the exhibition is the preference for Aristo paper, particularly among amateurs. Of portraitists, only one has exhibited in large style on Aristo paper, namely, Buhler, of Mannheim, whose Aristo landscapes have already met with general recognition in the *Verein zur Fördersing der Photographie*.

There is no question but that the Aristo paper gives the sharpest reproduction of all the fine details of the negative, and even furnishes a brilliant print from rather weak negatives; only one thing is disturbing, that is the strong gloss and oftentimes the unhealthy-like tone. That Aristo pictures do not surpass the silver pictures in durability is known.

The bromide of silver paper took, of course, a prominent part at the exhibition aside from these new papers, in the production of enlargements. While formerly this had been a specialty of three or four German firms, the enlarging process has become such an easy matter after the introduction of bromide of silver paper that even amateurs become experts. One of the most prominent is E. Körner, who, in the most simple way, makes the enlargements with the same objective and apparatus with which he made the negative, by putting the negative into the holder and holding the latter with the slide drawn towards the light, while the objective extends into a dark room, projecting here the enlargement upon a screen placed opposite. This manipulation requires a careful determination of the time of exposure, on account of the changing daylight, but Körner's achievements are not to be doubted, as is proved by his pictures. Among the professionals Paul Meyer is prominent; his architectural views (enlarged on Stolze paper by magnesium) are first class. But not all pictures of extra size at the exhibition were enlargements.

The magnificent architectural pictures of Schmitz, of Cologne, giving quite the impression of enlargements, are direct views on dry plates of 110 centimeters from Westendorp & Gebhardt. The exposure of one of these pictures (a dark interior) with a Busch pantoscope took three days.

The remarkably gray-blue tone of the pictures gave rise to the belief that they were enlargements.

Our modern dry plate permits also of taking life-size pictures direct from the person, of course at the expense of sharpness in the background. Some surprising exhibits in this branch were made by Byrne, of Richmond, who figured pretty prominently. Quite a peculiar field for enlarging is worked by Franz Kühn, of Berlin, namely, the enlargement upon linen. He has surpassed all the others in size in the life-size picture of the Emperor of Austria in full figure. It is evident that such pictures are preferred for painting in oil.

If the exhibition furnishes proof that photography has taken a new direction with regard to the positive process, something similar may also be said of the negative process in regard to the more and more extended application of the color sensitive plates.

In the beginning attention was paid to them only by reproducers. Their excellency for other things—for instance, landscapes—was convincingly proved several years ago by Goebel, Deldin and Knetsch (the latter for azalin plates); the

first named, by his magnificent panorama of "The Ruhr," giving the finest details of foliage and distance, which otherwise had always a more or less foggy appearance. But the yellow glass, which is indispensable for azalin plates, gave much offence, and it is only since the introduction of the eosin silver plate, which does not require the yellow glass for landscapes, that the application of color sensitive plates has become more general, and they have even made their way into portraiture, as proved by Salle & Kuntze's pictures, particularly portraits of many colors, such as uniforms, etc. In reproductions, landscape, architectural and scientific photography, color sensitive views were well represented.

Firms for reproductions do not mention the application of the color sensitive plate any more in a business way; it is considered as a matter of course, not only in Europe but also in the United States. Kurtz, from New York, sent some magnificent reproductions from European originals on azalin plates, whose excellency is even recognized by such art critics like Ludwig Pietsch.

Another important advance shown at the exhibition are the different processes with the printing press.

The "Licht pressendruck"—under which name we comprise all methods to produce printing plates for the press with the aid of photography—was formerly considered an object of the greatest secrecy.

The principle of photo-lithography was perhaps known. But heliography copper-light print in lines, and photo-engraving copper-light print in half tones, was only occasionally mentioned, and all work in places of that kind was done with closed doors. Now the veil has been removed. The hope of Albert that the Lichtdruck would be introduced into every portrait gallery, and that it would be used for even one dozen pictures, has not been realized. But the fact remains that Albert, Husnik and Obernetter have originated a new, easily executed printing-press process out of the old, incomplete Thessie process, which threatens to compete seriously with lithography.

Originated in France, the completion of the process was reserved for Germany, and it is the only printing process which (besides the Woodbury process) furnishes pictures deceptively equal to genuine photographic prints.

Four text-books treating about this process have already been published. The exhibit of Stengel and Markert shows the manifold application of the process in a surprising way. Obernetter's photo-gravure process (copper licht druck) which differs from all the others, and is a substitution process, takes a peculiar position, having furnished already many promising results.

Of still higher importance for illustrated literature than the copper licht druck is autotypy, the light picture relief-etching in half tones for the letter-printing press. The introduction of the "Net," through which the picture to be reproduced is copied and which divides the half tones, has solved the great problem.

Angerer and Goschl, the Autotype Company of Munich, and Riffarth of Berlin, prove the variety and capability of the process in a magnificent manner—not only in black, but also in variegated colors. It is certain that modern illustrated literature cannot exist any more without the light picture—relief—etching. Even illustrations of comic journals like *Ull*, are made by Riffarth exclusively by relief etching. The exhibition has indeed offered a fine opportunity to admire the great progress made in this branch. We regret only that Kurtz's excellent autotypes were missing at the exhibition.

We come now to portraiture. Qualitatively this was excellently represented. We were told that several of the "first" photographers were missing. We might be allowed to answer that these so-called "first ones" could have sent nothing better than we had on exhibition. There were not so many portraits exhibited as in 1865, but this fact is only a sign of the times. At that time portraiture was the principal branch of photography. All other branches took a back seat. Now it has changed. The public has been taught by the exhibition that photography exists for more purposes than portraiture, and that it plays an eminent part in the culture of our present time. Qualitatively the portrait branch was magnificently represented. Fechner, and Loescher and Petsch have gained new laurels. Fechner's exhibit astonished many. He had never made such a public show before. Bold light effects he has mostly avoided. Loescher and Petsch, on the contrary, show their virtuoso work here in their genre pictures in direct sunlight, their portraits on a quite white or very dark background. For more than twenty-five years this firm has cleared the path upon the fields of artistic lighting. Fechner's portraits of Berlin artists remind us of Carjat, who was the man of his day in 1865. Mostly commented upon by artists was the careful application of negative retouching in both exhibits, which nowadays has to cover everything. The photographer may assert as his excuse that he is forced by the public, but he will never be able to convince an artist of this. Therefore the criticism of many artists.

The quarrel about this point, the conflict between artist and business, will never be ended, the business part requiring likewise its rights. More about the exhibition in my next.

For some time past there has been produced for bleacheries a bi-sulphite of soda solution saturated with sulphurous acid by introducing gaseous oxide of sulphur (sulphurous acid) into concentrated soda solution, which contains a large quantity (50 per cent.) of concentrated and free sulphurous acid. These sulphite lyes have a strong concentration, show a considerable density (38 degrees Beaumé), and keep in corked bottles for many months. A good variety is furnished by Nashold in Aussig (Bohemia), which is used by me in the laboratory and is very cheap.

The solid bisulphite of soda (acid sulphite of soda) is proportionally much dearer and less effective, having only concentrated and no superfluous free sulphurous acid. The acid sulphite lye, as we will name the preparation, is readily applicable to photography.

Mr. A. Linear has shown that acidifying the fixing bath with a mixture of tartaric acid and sulphite of soda is an advantage, the acid fixing bath preventing the yellow coloring of the film by the pyro developer, acting also against fogging with the hydroquinone developer.

For acidifying the fixing bath the above mentioned sulphite lye is serviceable, and has been used by me regularly for some time for the fixing of bromide of silver gelatine plates.

One Liter fixing soda solution (about 1:4, the concentration of ordinary fixing baths for dry plates) and 50 cc. (or more) of acid sulphite lye are mixed. The fixing bath can be applied at once. The plates coming from the developer are well washed and placed in this fixing bath, which can be used until it becomes brown (which takes several days). By an addition of sulphite lye the fixing bath can be improved again, until it begins to work slow and the soda is exhausted.

The acid sulphite lye having proved just as advantageous as it is cheap to restore acid fixing baths, and being serviceable for pyro hydroquinone and pyro catechin developers, also presumably the eikonogen developer, its practical application is to be recommended.

At the same time, it may be mentioned here, that negative plates developed with pyro and fixed in ordinary fixing baths, and suffering hereby by careless treatment a yellow coloration of the film, can be saved securely with the acid sulphite lye. The washed negatives are placed in a dish with water, to which is added several cubic centimeters of the acid sulphite lye, with some muriatic or sulphuric acid, thus freeing considerable quantities of sulphurous acid. The yellow coloration is in a short time removed from this liquid and the film is cleared.

BERLIN, September, 1889.

VICTOR SCHUMANN AND HIS WORK.

BY ROMYN HITCHCOCK.

THE following extracts from my European note-book may prove of interest to the readers of the BULLETIN, especially to those who have read the contributions from Mr. Schumann's pen. I therefore gladly accede to the editor's request for an article upon the subject, only regretting that I cannot now devote more time to a revision of the notes in order to bring them up to date, for Mr. Schumann has made great progress in his work during the past nine months.

I had already gained an impression from Mr. Schumann's writings, and from a brief personal correspondence, that he was an industrious and thorough worker in the field of spectrum photography, but I was by no means prepared to find in his laboratory optical, electrical and other apparatus so extensive and of such superior quality. Every article is the best of its kind, and it is seldom that an investigator, even though he has the means, is willing to invest so liberally in apparatus and material that, most persons would say, can give no other return than fame. But there is, for one who earnestly works in any field of science, a reward far more satisfying to those who earn it, because its full merit is best known to the individual himself, and cannot, therefore, be undeserved—I mean the consciousness of having striven honestly and unselfishly for the discovery of truth.

Mr. Schumann has been principally engaged in spectrum photography—more particularly in the region of the ultra-violet, in the study of spark spectra, and in the practically very important study of the action of coloring matters on the sensitiveness of photographic plates.

For the examination of spark spectra in Geissler tubes Mr. Schumann has four excellent mercury pumps for exhaustion and one pressure pump. One of the exhaustion pumps is made without a joint, the tubing being continuous in every part. With this pump a very perfect vacuum can be obtained, but he has found it quite impossible to absolutely remove the air even with this pump. Where the remaining air comes from it is quite impossible to discover, but after the apparatus has been standing a short time a minute bubble of air can be collected in the bend of the tube when the mercury is allowed to run up. A small tube with phosphoric anhydride forms part of the apparatus, but this can be entirely cut off by mercury columns, and the pump operated independently of it. I thought the bubble must come from the mercury itself, but the mercury has been used for many months. At all events, it is interesting to know that

even the most perfect Sprengel pump does not remove all the air from the tubes. The vacuum is so perfect, however, that a spark cannot pass between electrodes separated by perhaps only a millimeter. The induction machine, which gives a spark of 25 cm. in air, passes around along the walls of the tube showing a yellow light.

A small tube, perhaps 10 cm. in length by 2 cm. in diameter, remained on this pump about four months, each day exhausted and heated over a lamp. It was made of especially fine glass, and the electrodes were of aluminium, approaching very close to each other. At first no spark would pass, but after a time a deposit of aluminium formed on the sides of the tube, and eventually became a strong and brilliant coating. Then the spark would pass quite readily.

Another pump, with joints of ground glass and mercury, is used to prepare tubes of hydrogen. The hydrogen generator is attached to the pump, and from it the gas can be admitted to fill the pump. The air being pumped out as much as possible, the gas is admitted. It runs into the Geissler tube and is pumped out again. This operation is repeated until the tube is filled with pure hydrogen vapor. Thus prepared the tube also contains mercury vapor. To remove this a portion of platinum black is sometimes placed in a receptacle provided for it in the Geissler tubes. Platinum thus used absorbs the mercury vapor so perfectly that the mercury spectrum is no longer seen, although some of the lines may be photographed if sufficient time be given to the exposure.

Geissler tubes in great variety have been used in these experiments. Among them may be particularly mentioned a series of tubes made in three groups of respectively four tubes, three and two tubes—in all nine tubes. The tubes of each group communicate with each other. They are all alike except that the capillary parts are of different sizes. They were filled with hydrogen at 2.75 mm. pressure, and the spectra differ according to the heat of the current in the different capillaries.

Another form of tube is for the study of ultra-violet radiations, for which purpose it is provided with stoppers of clear quartz. Mr. Schumann has a number of these expensive tubes. One is for the study of the glowlight, with aluminium electrodes. It has therefore a stopper of quartz on the side of the bulb that surrounds the electrodes, and another at the end of the tube so that the glow may be looked at end on, as it were.

The electrical apparatus consists of a fine influence machine, which gives a continuous succession of sparks 25 cm. in length, when the conditions are favorable, a coil by Kaiser and Schmidt, of Berlin, which gives sparks of 50 cm., and three other coils giving respectively 25, 8 and 1 cm. sparks.

The spectroscopic apparatus is very complete. It includes a small spectrograph, a spectroscope of five prisms by Dr. Schröder, a large apparatus for photography with prisms and another with a Rowland grating. For measuring photographed spectra an apparatus by Julius Wanschaff, of Berlin, made especially for the purpose, is used. This consists of a stand on which two microscopes are mounted, one behind the other, giving a magnification of about 35. The front microscope is focused upon the spectrum, photographed on glass, the back one on a millimeter scale. The former has fixed cross wires, the other a Jackson micrometer with double lines. This instrument, which measures within a probable error μ 2d, 3d, cost 500 marks.

For spectra of ultra-violet rays, quartz prisms and lenses are exclusively

used. Of these Mr. Schumann has a very fine assortment. The lenses are single. A lens of Iceland spar and quartz, achromatized, has been found quite useless. The prisms are made by combining two prisms of right and left-handed quartz, using glycerine to unite them. The single prisms are 30 degrees each, making the complete prism 60 degrees. Two such compound prisms are better than two simple prisms of 60 degrees, one of right and the other of left-handed quartz. Indeed it is only by the use of such prisms that spectrum lines can be sharply defined. The largest prisms he has are a set of four Cornu double prisms, measuring 40 mm. across and 36 mm. in height. This set, made by Halle, cost 300 marks.

The importance of the use of quartz for ultra-violet may be judged from the fact that a plate of glass only 0.01 mm. in thickness causes the loss of many lines in that region. Flint glass absorbs more than crown. I have a plate showing the absorptive effect of crown glass. The source of light was the iron spark. The glass was a fine wedge, the edge of which was from 0.20 to 0.10 mm. in thickness. The wedge did not quite cover the slit, so a line of the spectrum shows above the absorbed portion. The absorption is complete from between the cadmium lines 17 (2747.7) and 18 (2572.3).

Mr. Schumann has made sharp photographs of the solar spectrum, and also of metallic and gaseous spectra, using a series of nine quartz prisms. I have one of these solar spectra taken with nine Cornu prisms of 60 degrees. It shows the ultra-violet portion. The lines are very clear and sharp. The sunlight was reflected from a silver mirror; the slit was 0.006 mm. wide; the plate a pure bromide gelatin emulsion, the exposure one minute. There is a slight difference in the clearness of the two sides of the plate. This is because one side was bathed in Dr. Eder's coeruleine. The effect of this coloring matter is scarcely of any consequence.

The greater part of Mr. Schumann's spectrum photography has been done with a large spectrograph, some of the features of which deserve careful description. The slit is probably one of the best ever made. It was constructed by Mr. Schumann, who is a mechanical engineer, and therefore able to perfect much of his own apparatus. The jaws are made of hard steel, which is the best material for a slit. One side is moveable while the other side remains fixed, although there is an angular adjustment to the fixed side also, whereby a wedge-shaped slit may be used when required. The total available length of the slit is 18 mm. By means of a series of slots cut in two revolving discs the length of the slit is divided into three or six equal parts, so that, without changing the position of the sensitive plate, six spectra can be successively photographed one above the other. This ensures absolute coincidence of the lines common to the several spectra, while the fact that the negatives thus produced are perfectly clear, quite free from the slightest indication of diffused light, proves the excellence of the optical arrangements. The slit may also be turned with a screw in the axis of the collimator. There is also a short tube with a hair line which is used in adjusting the instrument. The hair is set horizontally across the slit and serves as a means of focusing for a continuous spectrum.

The optical parts are all of quartz. The collimator lens has a focus of 750 mm. for the *D* line. To center the light in the axis a small brass tube, carrying a mirror at its lower end set at the proper angle, is fixed so as to stick down between the prism and the collimator lens. Looking down this tube (which has

no lenses), the source of light and the slit can be seen. The tube is then drawn up out of the way.

The light is condensed upon the slit by means of two cylindrical convex quartz lenses, each on its own stand. The axis of the first is vertical, that of the second horizontal.

The prisms, of which there are nine, are of the Cornu form, that is, each is composed of two prisms of right and left rotating quartz of 30 degrees, cemented together with glycerine. The camera is a brass tube, at the further end of which is a simple flap rising inside the tube, for a shutter. The quartz lens is practically the same as that in the collimator, having the same focal length. A collimator has also been used with a focal length of 2.5 meters.

The plate holder is made to receive plates 18 x 14 cm. The plates used for spectrum photographs are of thin glass, and measure 18 x 6½ cm. As many as twelve spectra of the usual width, about 4½ mm., may be taken on a single plate.

The ultra-violet of the solar spectrum, as mapped by M. Cornu, extends to the line marked *M* 2948. This is far beyond the limit of the visible spectrum, which may be said to end not far beyond *K* when quartz prisms are used. The observations of Schumann, and especially of Professor Oskar Simony, have shown that in a clear atmosphere lines considerably beyond *U* may be photographed. Simony's photographs taken at high mountain altitudes doubtless extend to 2932 to 2935, but his results had not been fully studied at the time of my visit to Vienna, where I had the pleasure of examining some of his negatives. The range of the ultra-violet is still further extended by the photography of metallic lines. Schumann has already succeeded in photographing the extremely refrangible lines of aluminium with his fine apparatus. These are at the extreme known limit of the ultra-violet, the last having a wave-length of 1852.

The photographs of Professor Simony have shown that there are some errors in M. Cornu's map. These were first discovered by Mr. Schumann. The line *T'* is represented by Cornu as double—Schumann and Simony find four lines there. The lines *S*₂ and *S* are found to be quite different from Cornu's. *S*₂ is a group of four lines, *S* is three lines, as Cornu shows them; but between *S*₂ and *S*, there is a faint line not shown by Cornu.

The cyanin experiments of Mr. Schumann are of great interest and importance. For some reason attempts have been made to discredit some of his observations. It is said that cyanin plates fog; that they will not give clear images, and that the red sensitizing action of cyanin is not so strong as it is said to be. Now, I have seen a great many of Mr. Schumann's cyanin plate photographs, and I can say that they fully bear out his statements. The plates are clear, and the special sensitizing action of cyanin enables the line *A* to be distinctly photographed. I can also state that of the three diagrams given in the *American Photographer* of 1888, p. 182, the last one represents better what Mr. Schumann's plates show than either of the other two.

Cyanin only exercises its strong sensitizing action on bromide emulsion that contains no iodide. The presence of iodide has a remarkable influence. With an emulsion containing about one hundred parts of silver bromide to twenty-five parts of silver iodide, the red maximum was very weak, even with petroleum light. With a pure bromide emulsion the maximum for the same exposure was very strong between *C* and *D*, and on into the green. This was well shown on

a plate coated with the two colored emulsions, in such a manner that the line of junction followed the middle line of the plate. The spectrum was photographed across this line, with the result above stated. No screen was used. With sunlight, without a screen, the greatest intensity is between *C* and a little beyond *D*—the middle maximum about *D*. This was well shown on a plate sensitized by bathing the opposite halves in two baths, one strong the other weak, and photographing the spectrum across the junction. The cyanin is not only a strong red and yellow sensitizer, but it seemed to me that it also reduced the action of the blue. The stronger bath gave stronger color sensitiveness, but if the bath is too strong the plate fogs. With a strong bath a weak developer must be used.

It is important to observe that in photographing the lines of the extreme red, as well as those of the ultra-violet of the solar spectrum, the spectra must be narrowed down very much, otherwise the lines will not be clear. This fact is illustrated by a series of negatives of the red end by Mr. Schumann, ranging down to a width of about one millimeter, and all of Professor Simony's ultra-violet spectra are very narrow. The reason for this is, probably, that during the long exposures necessary to photograph such extreme lines, the plates are affected by the very faint diffused light in the camera, and the more this general light is reduced the sharper the line will be.

The superiority of cyanin over azaline, with equal times of exposure, is shown by two plates, each having three spectra exposed, respectively, eight, four, and one-half minutes. The cyanin plate is clearer and shows decidedly more action in the red. In the spectra photographed in four minutes the cyanin shows a distinct photographic action, while the azaline plate shows a mere trace; with half a minute exposure the cyanin plate shows clear action, the azaline plate none.

U. S. National Museum, Washington, D. C.

THE CHEMISTRY OF MERCURY AND ITS SALTS, AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

MERCURY Hg (Hydrargyrum).

WITH the exception of bromine, mercury is the only element fluid at common temperatures. It solidifies as a soft, malleable crystalline mass at 40 degrees, and if then applied on the skin it instantly disorganizes it, producing a burning sensation. It volatilizes at all temperatures, does not decompose steam and does not oxidize in the air; but if heated to about its point of ebullition (350 degrees C.) it is slowly converted into mercuric oxide, HgO .

The vapors of mercury are deleterious and produce shaking and salivation. Sodium iodide is recommended as a preventive to workmen employed in the manufacture of looking-glasses.

Cold hydrochloric acid does not attack mercury. Even the gaseous acid has no action upon it unless air and water intervene. (Regnault.)

Nitric acid dissolves it with evolution of nitrogen oxide. Diluted and cold this acid gives rise to mercurous nitrate; hot and concentrated it converts it into the mercuric salt.

With the aid of heat sulphuric acid attacks it, evolving sulphur dioxide. Mercurous or mercuric sulphate is formed according to the temperature employed.

Aqua regia transforms it into mercuric chloride; chlorine, bromine, iodine, give corresponding compounds. By trituration with sulphur the black sulphide is formed.

Mercury does not unite with iron; with most of the other metals—potassium, zinc, copper, silver, gold, etc.—it forms unstable compounds termed amalgams, from which mercury is driven out by heat.

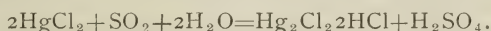
Mercury occurs native or as sulphide (cinnabar). Its metallurgy consists in simply roasting the mineral; the sulphur is transformed into sulphur dioxide; the mercury being volatilized condenses in receivers.

Mercury forms two series of salts—the mercuric compounds, in which it acts as a diatomic element, and the mercurous compounds, in which two atoms of mercury being united by one atomicity, and each one having one atomicity free, act as a diatomic element. The oxides and the haloid salts are all decomposed by light.

Mercury very finely divided and its salts are exceedingly poisonous. *Antidotes*.—Albumen, magnesia, sulphur. In its liquid form mercury is almost without action on the organism.

MERCUROUS CHLORIDE, Hg_2Cl_2 (Calomel).

Mercurous chloride may be prepared by precipitation by passing a current of sulphur dioxide into an aqueous solution of mercuric chloride:

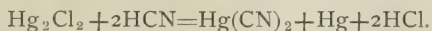


Thus obtained it occurs as a white powder, consisting of microscopic crystals.

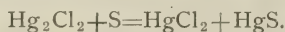
Mercurous chloride is stable in the air, colorless, without taste and odor, insoluble in water, alcohol, ether and dilute acids. Under the action of light it turns yellow, then gray, by partial decomposition into mercuric chloride and mercury. It should, therefore, be kept in black bottles.

Various organic substances—cane sugar, for example—decompose it, especially in presence of dampness or the air contaminated with gaseous ammonia, ammoniac carbonate or ozonized oxygen. Ammonium nitrate dissolves it. (Hager.)

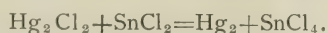
Hydrocyanic acid reduces it to mercuric cyanide, mercury and hydrocyanic acid:



Hot nitric acid gives mercuric chloride, and nitrate. Sulphuric acid, concentrated and hot, gives mercuric chloride and sulphate. Chlorine, bromine and iodine give the corresponding mercuric compounds. Potassium iodide transforms it into mercurous iodide, which in excess of KI splits into mercuric iodide and mercury. With sulphur mercuric chloride and sulphide are formed:



The agents of reduction—sulphurous acid, stannous chloride—displace chlorine, setting mercury free:

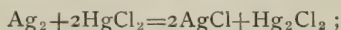


Zinc, copper and other metals dissociate chlorine, being amalgamated. The salts of mercury can be thus detected.

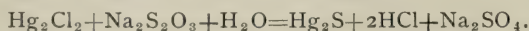
In photography it is the base of useful intensifying processes, being transformed by suitable reagents into opaque compounds of a non-actinic color. It was indicated by Sir John Herschel in his memoir on the “Chemical Agency

of the Rays of the Solar Spectrum."* We quote: "By far the most remarkable fixing process with which I am acquainted, consists in washing over the picture with a weak solution of corrosive sublimate and then laying it for a few moments in water. This at once and completely obliterates the picture, reducing it to the state of perfectly white paper. * * * Nevertheless, the picture, though invisible, is only dormant, and may be instantly revived in all its force by merely brushing it over with a solution of neutral hyposulphite, after which it remains as insensible as before to the action of light."

This process was applied by Scott Archer, both for the intensification of negatives and the whitening of positive pictures (alabastrine process) in the collodion process; † thus a negative fixed and washed is treated with a solution of mercuric chloride, which transforms the metallic silver, of which the image is formed, into silver chloride and becomes mercurous chloride:



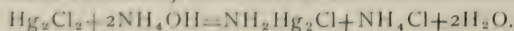
and by washing the bleached picture—as it is technically termed—with a weak solution of sodium thiosulphate (hyposulphite), the mercurous salt is resolved into a black compound which intensifies the negative:



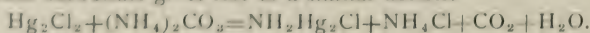
Hg_2S is not a definite compound, mercurous sulphide, but a mixture of mercury with mercuric sulphide, soluble only in aqua regia and resolved by heat into its two constituents, $\text{Hg} + \text{HgS}$.

On the first application of mercuric chloride, the photographic image blackens from the amalgamation of silver with mercury, and if the action be stopped then, the image is intensified somewhat without the further application of a reagent. As the chemical change proceeds, it will be remarked, by examining the negative from the back, that the half tints, being formed by a thin layer of metallic silver, are first bleached through, while the high lights are only superficially acted on, provided the mercuric solution be weak enough to have the action under control. Hence the intensification of the half tints by the reagent will be greater than that of the high lights, if the change be stopped at this second stage. But were the whole silver converted into AgCl , the deposit of Hg_2Cl_2 , being thicker in the high lights, their intensity would become greater than that of the half tints in proportion; and if the image be in gradation the result is a print often deficient in details in the lights and shadows. This reason is obvious. However, it is possible, even when the image is uniformly bleached through, to prevent this anomalous intensification. It suffices to employ a very dilute solution of the reagent, which, by acting slowly, produces the necessary change in the parts where Hg_2Cl_2 is in thinner layers before acting through the whole mass formed in the high lights. The action should, therefore, be stopped by washing at the proper stage of the process.

Sodium thiosulphate is seldom, if ever used, in the gelatine process, on account of the long and tedious washing required to free the gelatine film from that salt. Aqueous ammonia is generally substituted to transform the mercurous chloride into a black substance, dimercurous ammonium chloride:



Ammonium carbonate gives rise to a similar action:



(To be continued.)

* Phil. Trans, 1840, Part I.

† Athenæum, December 20, 1851.

ORTHOCHROMATIC PHOTOGRAPHY WITH GELATINE PLATES.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

[Read before the Photographic Convention of the United Kingdom.]

(Continued.)

TURNING now to the question of the use of orthochromatic methods for landscape work, I think I may say that the results exhibited at Birmingham last year were accepted as showing that these methods have considerable advantages over the ordinary method, the improvement being most noticeable in the rendering of foliage, water and distance. (Four sets of results, obtained in spring, summer and autumn, were exhibited in the form of lantern slides.) I have since endeavored to compare the various kinds of orthochromatic plates from this point of view, the comparison including: (1) Ordinary plates. (2) Edwards' isochromatic plates, used without a screen. (3) Obernetter-Vogel silver erythrosin plates, used without a screen. (4) Plates treated with an ammoniacal bath of erythrosin, and used with a pale yellow screen.

It seems necessary to point out once more that the whole value of comparisons of this kind depends entirely upon whether the experiments have been made fairly and without bias. I do not hesitate to say that many of the so-called comparative results which are exhibited are not fair. In very many cases, for example, the results shown as having been obtained with ordinary plates are very much inferior to the results which might have been obtained if the plates had been properly managed. In all cases the quality of the values obtained depends very largely upon exposure and development, a fact which is by no means sufficiently recognized. Many of the bad, nay, wretched results, so far as regards values, which are commonly exhibited, are due to insufficient exposure. If I have not been fair myself in the experiments which I bring before you, it is from want of ability, and not from intention. I am an investigator and not an advocate. We have certainly not yet reached finality in orthochromatic processes, but a knowledge of the relative merits of the methods which we do already has considerable practical value.

In the first place, I have made a number of comparative exposures with Edwards' isochromatic plates and ordinary plates, both being used without any screen. The ordinary plates were Thomas' thickly coated landscape, Wratten and Wainwright's ordinary. (The subjects exhibited were "Worcester Cathedral from Across the River;" "Kirkstall Abbey;" "A View from Bolton Abbey, with Distance and Foliage;" and "A Group with Foliage.") The differences are comparatively slight. As a rule, I do not think they are greater than might result from different exposure and development of the same plate. There is, at any rate, nothing approaching the striking differences observed when a yellow screen is used. In the case of the group, the isochromatic plate has a distinct advantage; but this was done rather late in the evening, when nature herself had provided a yellow screen in the shape of the water vapor and minute dust particles through which the rays of the setting sun have to pass. Many other experiments besides those shown lead to exactly the same result, and I believe my experience in this respect coincides with that of many other workers.

I have also made comparative experiments with ordinary plates (Paget prize plates XXX and Wratten's ordinary) and the Obernetter-Vogel silver erythrosin plates. Here I found a distinctly greater difference. (Subjects shown: "Knaresboro'—Foliage, Water and Distance;" "Bolton Woods, ditto;" "Warwick—Foliage and Water.") There is, as a rule, a distinct improvement over the ordinary plate in the rendering of foliage, water and distance, and I consider the differences greater than could arise simply from differences in manipulation. I have exposed a very considerable number of these plates, independently of comparative experiments, and an examination of the results leads to the same conclusions. The plates, however, are not particularly easy to manipulate, and some experience is required to obtain the best results. They show a decided tendency to fog with an excess of ammonia, especially if the proportion of bromide used as a restrainer is too low. I believe the best method of procedure

is to put all the bromide which you intend to use into the developer at first, and then add the ammonia gradually as development proceeds. At the same time, the results obtained are not equal to those obtained with a yellow screen, although, as far as my experience goes, distinctly, but not very greatly, in advance of the Edwards isochromatic.

Some comparative experiments were made with Obernetter-Vogel plates used without a screen, and plates prepared with ammoniacal erythrosin and used with a screen. These results (some of which are exhibited) confirm the conclusion already stated—namely, that so far as present methods are concerned, the best results are obtained with plates prepared with an ammoniacal bath of erythrosin, and used with a yellow screen. If, however, the Edwards isochromatic or Obernetter-Vogel plates are used with a yellow screen, which must be somewhat deeper in the first case than in the second, the results obtained are not distinguishable from those obtained with bathed plates under the same conditions, but the exposures required are much longer.

This brings me to the question of the use and abuse of the yellow screen, a point which I believe to be, as a rule, very imperfectly understood. All gelatine orthochromatic plates, prepared by methods at present known, remain relatively, with respect to the human eye, much too sensitive to blue and violet. The only method, therefore, of obtaining true values, is to interpose between the object and the plate a transparent yellow screen, which absorbs and cuts off a certain proportion of the blue and violet rays, leaving the less refrangible rays with a relative degree of intensity and activity more nearly corresponding with their relative action on the eye. It is obvious that any variation in the tint or thickness of the screen will affect the proportion of blue and violet cut off, and hence will determine the relative activities of the various rays after they have passed through it. From an optical point of view it is desirable to keep the screen as thin as possible, but the depth of tint of the screen admits of very considerable variation. As the depth of tint of the screen increases, the amount of blue and violet cut off increases proportionally, and the relative action of the less refrangible rays on the plate, or, in other words, the relative brightness with which green, yellow, orange and red objects are rendered, increases at the same time. It is obvious, therefore, that it is easy to make a screen so intense that far too large a proportion of blue and violet is cut off; blue and violet objects will then be too dark, and green, yellow and orange objects too light. In other words, the resulting photograph will be as incorrect in one direction as the ordinary photograph is in the other. In landscape work a screen too deep in tint causes loss of atmosphere, and with erythrosin plates under these conditions the grass and all other yellowish-green objects come out much too light. This effect is well seen in the examples exhibited. For landscapes the proper tint of screen is pale lemon-yellow; for paintings and similar subjects the depth of screen required is usually greater, and is determined by circumstances. [Examples were shown illustrating the bad effects of a screen too deep in tint.]

The great advantage of the screen in landscape work is that it prevents the failures, or, at any rate, want of complete success, which often results from the presence of a slight blue haze. The details in the distance, which so greatly increase the beauty of many landscapes, are rendered much more satisfactorily, and the more correct values obtained produce a roundness of the foliage, a transparency in the water, and a separation of the various planes of the picture which is rarely, if ever, obtained in any other way. This kind of effect is easily seen by looking at any ordinary view with the naked eye and then through a piece of yellow glass; the increased roundness of the objects and the separation of the planes is very striking.

It has been claimed as an advantage for commercial orthochromatic plates that they can be used without a screen, which of course is true, but the results obtained are not such as to lead any one to be enthusiastic about them. It seems as if an attempt were to be made to set up as the ideal of orthochromatic photography a plate which requires no screen. Given that the plate corre-

sponded in sensitiveness with the human eye, that idea would be realized; but we are some distance from realization at present so far as gelatine plates are concerned. Moreover, it seems to me that the use of a screen, with the possibility of varying it to suit the work in hand, or the result which it is desired to obtain, places in the hand of the artistic photographer a power which he would be unwise to cast aside. With the so-called photographer, who expects his apparatus and plates to do all the thinking for him, I am not at all concerned.

Not very long ago Colonel Waterhouse communicated to the Photographic Society of Great Britain the results of photographing the spectrum on plates treated with rhodamin, a comparatively new coloring matter similar to eosin in constitution. I have been able to make a few experiments with a view to ascertain its value for photographic work. The magnitude of its sensitizing effect was compared with that of erythrosin in the manner already described. Ordinary rhodamin, prepared by the Badische Anilin und Soda Fabrik was used and also some of the same rhodamin which had been purified. The results obtained are given in the form of a table. No preliminary bath was used, and the plates were not washed after treatment with the dye solution.

Sensitizer.	Ammonia.	Sensitometer.		
		Ilford Rapid.	Pall Mall Rapid.	Wratten's Ordinary.
Erythrosin.....1:10000	1 per cent.	16	15	11
Rhodamin commercial.....1:10000	1 per cent.	12	4	5
“ “1:5000	1 per cent.	15	7	7
Rhodamin purified.....1:10000	1 per cent.	10	3	5
“ “1:5000	1 per cent.	15	7	6

It will be seen that with one brand of plate the sensitiveness approaches that obtained with erythrosin, but with the other brands it is considerably lower.

The numbers show clearly the influence of the concentration of the dye; they show also the influence of the nature of the plate. They seem to show that the sensitiveness to the less refrangible rays obtained with rhodamin does not depend on the original sensitiveness of the plate, and that variations in the nature of the plate do not affect rhodamin in the same way as erythrosin. These and other points, however, require further investigation.

I also used plates sensitized with rhodamin to copy some paintings, and obtained results which promise well for the utility of this sensitizer. The experiments were not sufficiently numerous to justify me in bringing them before the Convention. In fact, the photometric experiments must only be taken as provisional, and are liable to correction by subsequent work. I thought, however, the Convention would be glad to have some idea as to the probable utility of this compound, and I hope to have become better acquainted with its peculiarities and capabilities before our next meeting.

[From the *Photographic News*.]

THE FORM AND APPLICATION OF SINGLE ACHROMATIC LENSES.

BY T. R. DALLMEYER, F.R.A.S.

(Continued from page 465.)

2. *Correction of Central and Excentrical Pencils.*—It is impossible, in the short time allotted, to fully treat of this head. After a careful examination of the central pencil, move the camera by slow stages on its axis, so that the image of lamp-flame and star become nearer and nearer to the edges of the plate, and note, stage by stage, the quality of the image and the falling off of definition with a magnifier. By gradually examining the *structure* of the image of the object at different distances from the center, and, when indifferent, inserting diaphragms until a sufficient definition is obtained, you will easily record the power of your lens by noting, for example: Image on screen required in full detail is

6 inches square on a 10-inch by 8-inch plate; stop No. so and so, or $\frac{f}{a}$, must be used (I leave out now the question of depth of focus; that has been treated of before). Again, if the entire plate has to be filled, observe test objects at extreme edge of plate, and note stop for this, and so on. The chief errors met with are astigmatism and coma; the former is destructive of all definition; the latter, if very *aggravated*, destroys the structure too, but if nearly entirely eliminated the structure is not destroyed, and a brilliant image is the result. In constructing large lenses of the form Fig. 1, the astigmatism and violent coma produced render them of little use. Proper corrections for the lens in this respect must be consistent with a sufficiently flat field that it shall be a useful instrument. A perfect lens should show the lamp and star the same throughout the entire field as for the center. My own experience lately has shown that great improvements in this respect are gained by employing some of the Jena glasses; but unfortunately those that should show very material advances are marked with the danger signal for lasting properties.

3. *Angle of Circle of Illumination.*—This is well to know, as you are certain of what plate can be fully illuminated, and, with a given lens, how much the sliding front of a camera may be used, not to run the risk of leaving unexposed corners. It is best found by screwing the lens on a larger camera than that it is usually employed on, finding the measure of the circle of illumination given, and with a known focus determining the angle included. Lenses are constructed, including various angles, according to the requirements of the situation, and on referring to the diagram the largest angle is seen to be included by the wide angle landscape, and the least by the long focus. There is no doubt that for pictorial effect the lens including a small angle gives a more pleasing picture. This has been fully entered into from the art side of photography that has been ably handled by well known authorities. The eye of itself, without movement of the head, only includes about 40 degrees or less, and any picture including very wide angles produces an unpleasant effect in that the foreground appears exaggerated and the distances dwarfed. For purposes of record, and where a good deal of subject is desired to be included upon the plate, the use of wide angle lenses is, of course, essential; but it must be borne in mind that because a lens is called wide angle it need not necessarily be strained to its full extent; and any number of lenses, no matter what their form, of a given focus, and working on a given size of plate, would all include the same angle. However, the question of including a large angle is at variance (when free from spherical aberration) to working with a large aperture, and hence the reason of producing a more rapid lens, such as the long focus rapid landscape, where considerably less angle on a given plate is included, compared to a shorter focus used on the same plate, as in the case of the wide angle landscape.

4. *Distortion.*—The great drawback to single cemented combinations with the diaphragm placed in front, due to the position of the diaphragm, is a measurable marginal curvature of straight lines. In the wide angle landscape this is distinctly measurable. The diaphragm is in much closer proximity to the lens than in the narrow angle landscape lens, and, although it possesses certain commendable features in its equality of illumination throughout the plate, it has the disadvantage of a pronounced marginal distortion which renders its use prohibitive for architectural purposes. Curvature of field is remedied by placing the diaphragm further away from the lens, but the angle included, and the equality

of illumination, are interfered with. Where a small angle only need be included, as in the rapid landscape lens, the diaphragm is placed, therefore, at a greater distance, and the curves and glasses employed are so arranged that it is free from spherical aberration with a much larger aperture, and hence it works more rapidly. As the angle included is small, and the focus long, compared to the size of plate used, it is admirably adapted for making features of distant objects where little subject only is desired to be portrayed, and can be used for instantaneous effects, such as distant views, yachts in motion, instantaneous street views, etc. Distortion, although it can be measured, is hardly appreciable. The rectilinear landscape lens that I introduced last year is constructed with the special object of entirely curing the defects of single cemented combinations, and at the same time maintaining their advantages. This lens includes an angle intermediate between the others, and there is no trace of marginal distortion, and hence it can be applied to architectural subjects as well as ordinary landscape work. The quality of its marginal definition is so fine that it has proved a most useful lens for copying purposes, interiors, etc.

5. *Curvature of Field*.—This is a very important point to be investigated. The test objects should be carefully focused for in the center of the plate, and then the camera turned on its axis, and the image viewed at its edges, when it will be found necessary, according to the correction of the lens, to screw it in more or less. If the curvature of field is very great it easily accounts for the fact that the lens will not give on a plain surface clear definition throughout. This subject has always been a very difficult matter to cope with, for in obtaining a lens with very flat field, astigmatism, as a rule, comes in to such an extent that definition is destroyed; hence it is for the optician, with the material at his disposal, to produce the best mean between the allowable amount of curvature consistent with the best correction of the excentric pencil itself. The curvature of field becomes less and less noticeable the more the lens is stopped down, and a careful examination in this respect of the powers of the instrument should also be gauged and taken note of for reference.

6. *Brilliancy*.—The charm of single combination lenses is chiefly due to the brilliancy of the image they usually give. The larger the angle included, still admitting the full pencil of rays through the diaphragm, the more equal will be the illumination or uniform brilliancy of the picture produced. To measure this focus upon the lamp flame, and then screw the camera screen in some little way. When central, an illuminated disc of light, perfectly spherical, appears upon the screen. As this is moved towards the edges of the plate it will still remain perfectly spherical so long as the full pencil of light traverses the glass of the lens. A point will be found on either side of the axis at which that disc begins to alter its shape by being cut off on one side, showing where a portion of the full pencil has begun to be cut off. This continues until the remainder of the disc entirely vanishes as it is removed to the limit of the angle included. The more even the illumination, the more brilliant will be the image produced, if this is consistent with the correction of the excentric pencils, as before explained. Another point influencing brilliancy to be observed is the number and position of reflected images. I proposed this evening to treat of this subject, but it is such an extensive one that I have not yet been able (through lack of time) to present it to your notice fully investigated. I am of opinion that the brilliancy and position of the reflected images must be more or less detrimental

to brilliancy of the whole image ; but according to the forms of the lenses employed, and their positions relatively to one another, will depend the influence which such reflected images will bear to the brilliancy of the whole image. I pointed out in a letter in reply to Mr. W. K. Burton, in the *Photographic News*, how I explained that the air space in the rectilinear landscape did not cause it to suffer in its brilliancy so much as would be the case in the doublet with a diaphragm placed between them, and this point I would refer you to for investigating the effects produced. Mr. Burton wrote a reply in the form of an article in the *Photographic News*, and I hope to have the pleasure of contributing a full paper upon this subject later on. Another important consideration in brilliancy is that known as flare spot. No properly constructed lens should possess this. Its cause and cure were explained many years ago by my late father ; but it may be of interest to know the method of practical cure, in addition to the usual hint thrown out, is to move the stop a little bit in one direction or the other. If the camera be turned toward strong daylight, and focused for parallel rays, then the screen removed, and the eye placed at some little distance behind the screen, should flare spot be present the appearance of the lens is that of having a bright, ghost-like circle, partially covering the disc of the lens. By moving the stop, either to or from the lens, the size of this disc will alter, and if it be so placed that this ghost-like disc covers the whole, or as large a portion of the lens surface visible, the flare spot will be cured.

EIKONOGEN.

BY CHARLES L. MITCHELL, M.D.

[Read before the Photographic Society of Philadelphia.]

EIKONOGEN is the name of a new developing agent recently placed before the photographic public. It is the patented invention of a Dr. Andriessen, of Berlin, and is a chocolate-colored powder showing a crystalline formation of small laminæ, and has no taste or odor. It is said to be non-poisonous. It is sparingly soluble in water, about eighteen grains dissolving in an ounce, and forming a solution of a bright grass-green color. In chemical composition it is said to be an amido- β -naphthol- β -monosulphonate of sodium. It is claimed for this new developer that while its developing action is much quicker than either pyro or hydroquinone, it brings out the most perfect detail in the picture, even though a very short exposure has been made. It gives a clear negative of a bluish-black color, and is especially recommended for instantaneous work. It is also said to give excellent results in developing lantern slides and transparencies.

During the past week I have made some few experiments with eikonogen, particularly as a developer for lantern slides, and I propose to discuss briefly this evening the results of these experiments. The developer used was a slight modification of the formula given by the inventor, Dr. Andriessen, that having been found to be almost too strong to give the best results. It was prepared according to the following formula:

No. 1.

Eikonogen.....	½ ounce.
Sulphite sodium, cryst.....	1 "
Water.....	1 pint.

No. 2.

Carbonate sodium, cryst.....	¾ ounce.
Water.....	1 pint.

For normal developer, take of No. 1 and No. 2 each one part, water two parts.

The results obtained with this developer have so far seemed to justify all that has been said in its favor. Two lantern plates were given the same exposure (a rather short one) upon a given negative, and then placed in separate dishes. To one was added the eikonogen developer mixed as above, to the other a hydroquinone developer prepared with phosphate and carbonate sodium. With the eikonogen the image began to appear in about ten seconds, and in two minutes was fully developed, ready to be washed and fixed. With the hydroquinone developer the image began to appear gradually at the end of the first minute, and at the expiration of five minutes was not fully developed. It required nearly five minutes more to complete the development, and the resulting plate lacked density and detail, and was evidently much undertimed. On the other hand the plate developed with eikonogen had good density and was full of the most exquisite detail.

The color of lantern slides produced by eikonogen varies according to the strength of the developer. With the formula previously given the color is a clear bluish-black in the deep shadows, graduating down to a beautiful gray in the lighter portions of the picture. If a developer is used containing one-half the quantity of No. 2, and twice as much water, and a longer exposure be given, the tone obtained is much warmer, and is of an olive brown or gray color, very soft and pleasing. With both developers, the most beautiful detail was obtained, and I consider that, for lantern slides, this developer, when properly used, will give results far superior to those obtained with either hydroquinone or oxalate. These experiments are merely tentative; and more familiarity with this new agent, and possibly some modification in the formulas, will be required before the best results can be obtained. It works quickly, does not stain the film, and can be used for a number of plates before becoming exhausted. The six lantern slides I show you this evening were developed with one ounce of this developer, and with the last plate it showed no signs of exhaustion.

As a developer for negatives and instantaneous work, eikonogen will probably prove as excellent as it has for lantern slides. The negatives I show you now were made this afternoon, about 4 P.M., with a Hawkeye camera, using Cramer plates, sensitometer 35. Although the light was rather weak, and the plates not very fast, I think you will find that they show excellent detail and seem, if anything, to appear a little overtuned. I am now experimenting with eikonogen as a developer for negatives and especially instantaneous work, and trust to make a further report at some future meeting.

As far as its price and developing power are concerned, it is probably quite as cheap if not cheaper than pyro. It costs now about forty cents per ounce, and in developing power it will probably go much further than the pyro, while as an additional attraction it does not become dark and discolored, nor will it stain the fingers, and hence will be much preferred by the amateur.

As a developing agent I believe that eikonogen has come to stay, and where its use is fully understood, I believe it will be found to be the most formidable rival to pyro that has yet appeared.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

THE ENGLISH CONVENTION.

PRESIDENT PRINGLE'S ADDRESS.

I AM aware that the president of a learned or artistic body, on an occasion such as this, is usually expected to deliver a weighty address on some subject chosen by himself as being specially within his province or specially congenial to his taste; but in this year, the fiftieth, as I hope to show, of practical photography, the course clearly indicated for me to follow will be to trace before you the history of photography from its birth as a practical science to this, its "jubilee" year. A more momentous story, more gigantic and sudden strides, more at once of patient labor and of brilliant genius, will not be found to mark the history of any science than that of photography. If any science can be compared in these respects with photography it must be that of spectroscopy, and the two have, for evident reasons, gone hand in hand together.

It is difficult to realize here, and now, that fifty years ago, had the whole world been searched, half a dozen men could not have been brought together able to start or discuss any topic concerning photography; while in this country alone we have now at least ninety societies, numbering many thousands of members, every one more or less conversant with some of the many photographic processes in use in our day. I have been unable to ascertain with anything like exactitude the number of persons now actually engaged in the production of photographs, in the manufacture of photographic materials, in photography as a livelihood, as a recreation, and as an adjunct to other sciences. I can only say that to-day photography supports, amuses, and helps tens of thousands in this country. Let us now look back fifty years.

In 1839 Louis Jacques Daguerre, after many years of labor, partly in collaboration with Joseph Nicéphore Niepce, obtained from the French government a pension for the production of the process we later knew as Daguerreotype. It is said that in January, 1839, Daguerre communicated the details of his process to Arago, a famous scientist of that time, but what we know is that on this very day, the 19th of August, fifty years ago, and probably about this very hour, Daguerre's process was fully divulged to the Académie des Sciences in Paris. But it would ill become me, for the sake of "making a point," to ignore the claims of our own countrymen, several of whose processes we are working to this day, while Daguerre's process was never known to most of us, and was long ago relinquished by all of us who ever knew it. On the 25th of January, 1839, the great chemist, Faraday, described to the Royal Institution Fox Talbot's process of photogenic drawing, and on the last day of the same month Talbot himself read a paper on the same subject before the Royal Society, saying that he had produced results practically the same in 1835. Talbot used sodium chloride and silver nitrate on paper, these salts being not unfamiliar to us at the present time. And, farther, when, in 1841, Talbot's claim for patent protection was opposed, it was proved that the Rev. J. B. Reade (the "good old rector," as I have heard him called) had during, if not before, 1839 sensitized his wife's white kid gloves with silver chloride, and, as a result of these experiments, had been led to use galls to render the action more rapid. Talbot's claim in this case was upheld, but in 1843 he made a less successful application for protection, when he claimed the use of sodium hyposulphite as a fixing agent. But it was clearly proved that in 1839 Sir John Herschel had shown the use of our familiar "hypo" in photography, having many years previously discovered its solvent action on silver haloids. During 1839, too, Herschel used glass as support for his sensitive film, though it was not till later that a "vehicle," as we now call it, was used to bear the sensitive salts on the glass. Dr. Fyfe, in 1839, sensitised paper with sodium phosphate; and lastly, in the same year, Mungo Ponton published in Edinburgh his experiments on the action of potassium chromates on gelatine. Either in 1839 or 1840 *sel d'or*, the hyposulphite of gold and sodium was used as a toning agent for Daguerreotype plates. Thus we have not only the Daguerre process, but the silver chloride process, a development process, the fixing process, the use of glass, the

principle of a vast array of gelatine printing processes, and, perhaps, the foundation of our toning process, all bursting upon the world in one year; and surely I may say that we celebrate with justice the jubilee year of photography.

I must not weary you with details too minute of the course of events following these I have mentioned. I will try merely to point to the most conspicuous landmarks of our history. 1840 saw bromide, and 1841 chloride, added to our silver haloids, the former by Goddard, the latter by Claudet. Claudet was one of the two photographers then in business in London; Edinburgh had a photographer, Birmingham had one, and in Britain there were only these four.

In 1841 the term "negative," now so well known, was first used by Herschel, and Petzval designed lenses having their visual and actinic foci coincident.

Talbot's calotype process held sway for some years. Until 1850 the paper constituting at once "vehicle" and "support" was not even waxed.

We now come to a very important era. In 1849 Le Gray suggested that collodion might furnish an excellent *menstruum* for our silver salts, but the general opinion is that the credit of the collodion process is due to Fred. Scott Archer, who certainly used the wet collodion process in 1850, and published his method of using it in 1851. But our friend W. K. Burton has heard the late J. G. Tunny, of Edinburgh—who was a patriarch in photography—say that before Archer's publication Le Gray furnished him—Mr. Tunny—with a practical collodion bath process, and, further, that Le Gray developed with sulphate of iron. For many years wet collodion reigned supreme, and with good reason, for it was a process capable of yielding the very finest results. But the inconveniences attending the use of this process, the vaporous exhalations, and the staining propensities of the bath solution, as well as the necessity for cumbersome tents and other paraphernalia, set a cloud of experimentalists to search for some method to obviate these troubles. From Taupenot's process, 1855, to Abney's albumen beer, 1874, much valuable work was done, but in the opinion of most competent judges not one of these processes, not one, indeed, of all the other collodion processes, yielded results equal, on the whole, to the wet collodion process.

The first photographic exhibition was held at the Society of Arts in 1852. The first photographic society was the Photographic Society of London, dating from 1853. The first public photographic periodical was *The British Journal of Photography*, which started as a monthly in 1854.

The next era with which we have to deal was that of collodion emulsion. On September 9, 1864, B. J. Sayce and W. B. Bolton published their unwashed collodion emulsion process; soon after this Sayce seems to have retired from the photographic world, but Bolton has from time to time ever since shone out in some new or improved process. In 1874 he gave us his process for washed collodion emulsion, whereby, instead of having to wash each coated plate, we were enabled to wash our emulsion in bulk, and, further, to preserve it in the dry state for a long time.

We have it on record that in 1868 W. H. Harrison made an emulsion with gelatine, silver nitrate, and cadmium bromide and iodide. Mr. W. Jerome Harrison, in his admirable "History of Photography," to which I am indebted for much valuable information, mentions this experiment of W. H. Harrison, and rightly points out that most writers have overlooked this fact of an early attempt at a gelatine emulsion. (Extract from *British Journal* was read.) *The British Journal of Photography*, September 8, 1871, contains an article by Dr. Richard L. Maddox, proving for the first time that gelatine emulsion was a fact practicable and accomplished.

A word on Dr. Maddox—my guide, philosopher, and friend. Though for over forty years he has suffered from a distressing malady—always in discomfort, often in agony—these forty years, and more besides, have been wholly devoted to science, and the results of these labors have been ungrudgingly given to the world without thought of gain, and with too scanty recognition.

In 1873 we find Burgess advertising gelatine emulsion, and Kennett obtaining protection for a gelatine emulsion pellicle requiring only to be melted and

poured on a plate. Various modifications were introduced during the next four years, but the great event that brought our negative process to the point where it now practically stands took place in 1878. Very many in this audience will remember the surprise created when on March 7, 1878, Charles Bennett showed, at the South London Photographic Society, negatives on gelatine bromide emulsion produced under conditions that would have been totally inadequate to produce a useful image on any plate previously prepared. Bennett, in a truly magnanimous manner, did not hesitate freely to give his process to the world in *The British Journal of Photography*, March 29th, and so fully was his method described, that many present to-night were able almost at first trial to produce results similar to those of the discoverer. Bennett, by prolonged action of moderate heat on the emulsion, altered the molecular state of the silver bromide in such a way that the sensitiveness to light of the silver haloid was vastly increased, and in process of time it was found that a much greater heat applied for a much shorter time to the silver bromide in a less viscous solution of gelatine effected the same desirable change, and in this position our gelatine bromide process may be said to stand at the present day. Monckhoven, in Belgium, showed that a similar result to that obtained by boiling may be achieved by the use of ammonia, but I may say, speaking for myself, that it seems to me matter for regret that the injurious ammonio-nitrate process was ever made known, for I am convinced that the use of it has done much mischief to commercial gelatine emulsion plate making.

In the details of gelatine emulsion, many improvements have from time to time been suggested. Iodide was added by Abney; chloride was also used, and considerable ingenuity has been shown in contrivances for getting rid of the bye products of the decomposition taking place at emulsification. King used dialysis, Wratten precipitated by alcohol, Plener separated by centrifugal force, and again, speaking for myself, Plener's system, elaborated by H. L. Henderson, is the one that for certainty, simplicity and regularity commends itself to me.

Regarding negative processes, it may be said that while processes now obsolete rendered magnificent results (though doubtless the fittest only have survived to attract our admiration), still to day we get results equally good in all cases, with much more ease and rapidity, and we can now in certain branches achieve results wholly beyond the reach of any process except the gelatine bromide in use to-day.

In printing processes our great want, our great aim, and our great achievement during these fifty years have been in the direction of permanence of result. The albumen paper, in its virtues as in its defects, stands pretty nearly where it stood half a century ago, but we have now several processes of indubitable permanence—the platinotype process, patented by Willis in 1873; the carbon processes founded by Ponton's discovery of 1839; and the gelatine bromide, and perhaps gelatine chloride processes of later dates.

Paper and other substitutes for glass have always exercised great influence on outdoor photography; from the days of Melhuish's roller slide till the advent of the Eastman-Walker roll holder; from Talbot's calotype to the present day of celluloid films, the matter has been steadily kept in our view. The public mind is now on the alert for a process, said to be achieved, yielding a transparent film, capable of being wound on a roller and exposed in a roll holder.

In the province known as photo-mechanical printing we have made enormous strides, but as this subject has never occupied my attention I refrain from discussing a subject of which I am ignorant.

A shortcoming of photography, if possible more serious than want of permanence, has been in correct translation into monotone of certain colors. Colors found in nature and in painting giving effects of brightness to the eye are rendered by ordinary photography as dark, while certain colors more or less sombre to the eye in nature and used as low tones by painters are represented by ordinary photography as high lights. I have deliberately left orthochromatic, or, as I prefer to call it, color-correct photography, to the end of my remarks on our

technique, because this line of research is at present engaging our chief attention, and because in this direction certainly lies our next great advance.

In 1873 Vogel discovered that certain dyes make photographic plates more relatively sensitive to some of the less refrangible rays of the spectrum. In 1874 Becquerel used chlorophyll, and in 1876 Waterhouse used eosin with collodion plates. 1879 Ives published his system of using chlorophyll obtained from the blue myrtle. On January 8, 1883, Tailfer obtained provisional protection for the use of eosin with gelatine plates, ammonia being used along with the dye. This patent stands at this day, and is worked by an English firm. On December 4, 1884, Dr. Eder read a most important paper on the subject before the Vienna Academy of Science, and since then he has published several papers, all of the greatest value as contributions to the subject of color-correct photography. The eyes of photographers in this country were first opened to the advantages of orthochromatic photography by the exhibits at Pall Mall of Dixon & Gray, whose work, however, seems to have been stopped by the Tailfer patent I have mentioned. Dr. Mallman, in the same year, 1886, gave a valuable paper to the Photographic Society of Great Britain, showing ways of using various dyes so as to produce effects in color-rendering equal, if not superior to the results obtainable on commercial plates. The next year saw the entrance of our friend C. H. Bothamley into the arena of ortho-chromatics, for in that year he read a paper to the Society of Chemical Industry, wherein he described his repetition of Eder's experiments, and his investigation of the group of eosin dyes. Also, he exhibited comparative results which went to prove that the relative sensitiveness conferred by the dyes was even greater than had been supposed. In 1887 Mr. Bothamley first flashed upon our astonished senses at the Glasgow Convention, as all who were present cannot fail to remember. Since that time he has been the leader of British research into color-correct photography for general purposes; while Captain Abney's attention has been turned to the more special line of spectrum photography. I do not hesitate to say that to color-correct photography we must look for the next important era in photography.

(To be continued.)

ROYAL IMPERIAL INSTITUTE FOR PHOTOGRAPHY AND REPRODUCTION PROCESSES IN VIENNA.

COURSES OF INSTRUCTION.

Preparatory Drawing School.—(Evening school: tuition, 5 fl. for the whole year.)

Lessons are given in elementary free hand-drawing, geometric drawing, natural philosophy, commercial arithmetic and business letters.

First Course for Photography and Reproduction Processes.—(Evening school: tuition, 5 fl. per course.)

Lessons are given in free hand-drawing, projection and perspective (with particular regard to special technical processes of drawing for reproduction purposes for advanced scholars, and to further their improvement in drawing from plaster casts, as well as in lighting and color studies, lessons during the day time will be given in chemistry and physics with regard to photography and technical printing.) This course takes place in the evening, having regard to the possibility offered to scholars to learn practically during the day in galleries and printing establishments. To graduates of this class preference will be given for admission to the second course.

Second Course for Photography and Reproduction Processes.—(Day school: tuition, 10 fl. per course.)

Lectures are given on photo-chemistry, photographic methods of the printing processes, retouching as well as general knowledge of chemistry and the laws governing the protection of artistic and literary property.

Besides this, practical exercises of the scholars in the studios, laboratories and printing rooms of the institute, under supervision of technical teachers, will take place in portrait and reproduction photography, positive and negative retouching,

wet and dry negative processes, ortho-chromatic views, preparation of emulsion, positive printing processes, Lichtpans methods, carbon printing, platinotype prints, diapositives, enlargements, micro-photography, etc.; also in photo-mechanical reproduction processes, Lichtdruck photo-lithography, zinc etching, photo-zincotypy, and other special photo-mechanical methods according to requirements and means.

The studios and printing rooms will be open daily from 8 or 10 A.M. to 3 P.M.

According to remaining space scientists and artists will also be accepted as scholars for special applications of photography.

Special Course for Lithographic Press Methods, with Particular Regard to the Rapid Press and the Photographic Transfer Methods.

This takes place independent of the foregoing courses every Sunday from 8.30 A.M. to 12 M., from October 6th to December 31st; tuition, 5 fl., besides 1 fl. for materials used. The special course in lithography is particularly of value for professional lithographers and stone printers.

Particulars and programme to be had from the director of the institute, Dr. J. M. Eder, Vienna VII., Westbahnstrasse 25.

THE ERROR AT BOSTON.

To the Editors of the BULLETIN:

IN reply to a letter in your journal of September 28, 1889, signed by Rothen-gatter and Dillon, I would say that at the Buffalo Convention it was settled that no official recognition should be given to any private awards beyond the announcement of winners from the platform.

It has been customary for the parties making awards of this kind to appoint their own judges, collect their markings, and merely hand the names of winners to the presiding officer for announcement.

Had Mr. Eastman's agents informed themselves as to his manner of choosing judges there would not have been two sets of judges chosen.

The mere fact of Mr. Eastman's making the rules governing his awards the same as those of the Photographers' Association of America does not make the officers responsible for any acts of his agents or judges chosen.

So far as I understand it the first three judges were as eligible as the second three, for none were chosen according to the rules made by the Executive Committee.

The blunder has been made and I cannot understand why the officers of the Photographers' Association of America should now be called upon to straighten out a matter entirely out of their jurisdiction.

In conclusion I would say that the Eastman Dry Plate and Film Co. is alone responsible for the errors of its agents, and consequently are the only ones to look to for a decision in the matter.

H. McMICHAEL.

OUR ILLUSTRATION.

WITH this issue of the BULLETIN we present as a frontispiece one of the gems exhibited at Boston, illustrating Longfellow's beautiful poem, "Evangeline." The picture illustrates Mr. C. H. Stoddart's view of the blacksmith shop of Basil, with the children watching the smith at work. The grouping, lighting and the whole arrangement of the composition is truly artistic, and shows what photography, combined with thought, can do in giving form to poetic ideas. We must congratulate Mr. Stoddart on his undoubted success, and our readers in obtaining such a faithful reproduction of the beautiful original. We hope before long to give reproductions of other examples of the fine pictures which adorned the walls of the Exhibition at Boston.

The meeting was called to order by President Stanton shortly before eleven, and the minutes of the previous meeting having been adopted, the President delivered his annual address. In the course of his address he referred to the fact that this year is the semi-centennial of the birth of the art, Daguerre having made the discovery in the year 1839. He spoke of the progress of the art since the time of the great Frenchman, and urged his hearers to do all that lay in their power to raise photography above the position it now occupies.

It was with regret he announced the failure of the deputation which interviewed the government in reference to the lowering of the duty on dry plates. At the close of his address the President introduced the veteran photographer, Abram Bogardus, of New York, who addressed the Convention.

At the close of the morning meeting a great deal of animated conversation took place among the members regarding the dry plate duty. In fact from the conversation heard one would imagine the Convention to be a Free Trade Club. The grievance of the photographers is that in order to encourage the manufacture of Canadian plates of a quality generally regarded as inferior to imported ones, the government raised the duty on imported plates from 20 to 30 per cent., and in some cases of exceptionally fine plates to 87 per cent. A prominent photographer leant against the door and delivered himself of the statement that a little longer of such a policy would kill photography in Canada. The sentiment was concurred in by a group standing round. Even the principle of protection was not regarded as sacred.

The Convention resumed business at 3 P.M. The first business was the election of officers for the ensuing year, the result being as follows: *President*—Mr. J. S. Dixon, Toronto; *First Vice-President*—J. N. Eby, London; *Second Vice-President*—E. Stanton, Toronto; *Third Vice-President*—A. Pettaway, Ottawa; *Secretary-Treasurer*—E. Poole, St. Catharines.

After the officers had been elected some discussion occurred as to the place of meeting next year and the time. Some of the members wanted the meeting held in Toronto, at the time of the Industrial Exhibition, so that they could, to use their own words, "kill two birds with the one stone." It was ultimately decided to hold the meeting in Toronto, but during the month of August. Belleville was a strong favorite with some as first choice.

After the election of officers Mr. E. Poole read a paper demonstrating the development of dry plates. It was followed by a technical discussion on gold solution, and the silver bath and its difficulties.

A great many people, including several ladies, attended the evening meeting, and were evidently delighted with the collection of photographs on the walls. Mr. A. Bogardus, of New York, was introduced by the President and read a paper giving his forty-five years' experience as a photographer, and concluding with an appeal to all photographers to join the White Ribbon Society of Photographers recently formed for the purpose of elevating the profession. His lecture was highly amusing, as well as instructive, and some of his reminiscences of long life in the studio were very laughable. He said he had been taking pictures for forty-five years, and he sketched some of the people he had photographed. Amid great laughter he described the different eyes, mouths, noses and chins he had pointed his camera at, and described the eccentricities of his customers.

Mr. Clarke, of St. Louis, followed, and also strongly urged the photographers present to join the White Ribbon Society and elevate the art to the position it deserved to occupy.

A vote of thanks to the American exhibitors was carried unanimously, and with great enthusiasm. J. G. Ramsay and J. F. Bryce were then appointed auditors for the coming year, after which a discussion took place on the late increased charge for postal matter. The majority of those present, however, thought that the present rates were not too high.

A committee, consisting of E. Stanton and J. G. Ramsay, was next appointed to interview the underwriters regarding the high rates of insurance, and endeavor to come to some agreement with them whereby they should be lessened.

One hundred and fifty dollars was offered by the Stanly Dry Plate Company, of Montreal, to the person exhibiting the best collection of pictures on their plates exhibited at the convention next year.

George Knowlton, of Montreal, spoke on the vexed question of the dry plate tariff. He defended the tax, and thought that while it might be high, yet Canadian manufacturers required adequate protection.

Mr. Stanton replied to Mr. Knowlton's address. He said that the present duty of fifteen cents per square foot on plates equalled 87 per cent. *ad valorem* duty. This he con-

sidered a most unreasonable figure, and he advocated that a deputation of photographers should present a petition to the Minister of Customs asking for a reduction of the tariff to 30 per cent.

Mr. Knowlton said he was willing to sign a petition asking that a specific duty, equal to 30 per cent., be placed on plates, but he did not favor *ad valorem* duty.

It was then decided that Messrs. Stanton and Poole be a deputation to petition for the reduction of the present fifteen cents per square foot on dry plates to such a sum as would equal 30 per cent. On motion of Mr. Dixon it was decided to allow the secretary, Mr. Poole, \$50 a year for his services. Short addresses were then given by Messrs. Edgworth and Bezanson on subjects pertaining to photography, after which the convention was declared adjourned by the President.

BROOKLYN INSTITUTE—PHOTOGRAPHIC DEPARTMENT.

THE Department of Photography at the Brooklyn Institute held its first fall meeting on October 8th, at the Institute Building, 200 Washington street. *President* ALEXANDER BLACK occupied the chair. On behalf of the Excursion Committee Mr. John H. Dingman reported upon the summer photographic trips of the department, making some valuable suggestions as to future work in this direction. Mr. Dingman's report was accompanied by an exhibition of prints and lantern pictures illustrative of summer work. Various slides were also shown for the purpose of comparing various formulas for developing. Mr. Cook showed a number of slides developed with "pyro"; Mr. Dingman exhibited some admirable wet plate slides. Dr. Meeker's pictures were made with "iron," and a batch by the President and others were made with hydroquinone, iron, and by the wet plate method. The Anti-Dark Room Company gave an exhibition of the new ingredient used in developing by white light. It is called "Nuktagonia," and permits development in ordinary light. The department is now building a complete photographic laboratory.

CHICAGO CAMERA CLUB.

PROFESSOR S. W. BURNHAM, the eminent astronomer and photographer of the Lick Observatory of California, was the guest of the Club at its last meeting, October 10th. Professor Burnham and his colleague, Professor J. N. Schaeberle, are on their way to Cayenne,

French Guiana, to make astronomical and photographic observations of the eclipse of the sun, which occurs December 21st next. The East coast of South America and the West coast of Africa are the only places at which this eclipse can be observed. It is hoped, from the data obtained by the observations to be made by the American and English astronomers at this time, to determine more satisfactorily than is now known the nature of the sun's corona.

Dr. H. D. Garrison read an interesting paper on the scientific achievements of photography. A number of matters of interest to amateur photographers were brought to the attention of the Club. Among others two new developing agents just received from Europe, bearing the highly scientific names respectively of pyrocatechin and para-phenylendiamin. Then there was on exhibition a detective camera and walking-stick tripod, the invention of Mr. F. K. Dunn, a member of the Club. A handsome medal was awarded to Mrs. Zilda E. Mackie for the best photograph taken at the recent outing of the Club at Riverside, with honorable mention to Messrs. J. H. Smith, W. H. Sheney, Gayton A. Douglass and Mrs. N. Gray Bartlett. F. K. MORRILL,

Secretary.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

REGULAR MEETING, OCTOBER 1, 1889.

President H. J. NEWTON in the chair.

The *Secretary* announced the titles of journals and papers received for the Section, since its last meeting, for which the usual vote of thanks was tendered to the contributors.

The Executive Committee announced that an informal meeting of the Section would be held in the Trustees' rooms of the Institute October 16th, at 8 o'clock P. M. Subject: "The Object and Uses of the Section, together with a Brief Outline of its History." Also a regular meeting of the Section November 5th, at 8 o'clock P. M. Programme: Exhibition of slides made from negatives taken during the summer vacation by members of the Institute.

President NEWTON then announced the programme of the evening, and introduced to the audience the speaker, Professor Randall Spaulding, who, after making some preliminary remarks, exhibited and briefly explained a series of pictures he had taken during his late travels in Great Britain. These pictures, though taken by an amateur, clearly demon-

strated that he was no novice in the art of picture making, for they bore the marks of painstaking and careful workmanship, and viewed from an artistic standpoint would compare favorably with the best work of a professional photographer.

The interest in these pictures was also greatly increased by the unique manner of their description and by their favorable presentation by one of our most skillful stereopticon operators, Mr. A. D. Fisk.

The following are some of the views that called out the most hearty applause of the large and appreciative audience:

The series opened with a donkey and cart in the market place of Londonderry, Ireland. This was followed by pictures of the white limestone bluffs of the northern coast, curiously eroded by the sea into caves and arches; the ancient castle of Dunluce, crowning a rocky promontory of the shore; of the far-famed Giant's Causeway, in its general aspect and in detail, showing the extent and articulation of the columns, the marvelous jointing of the blocks, and not forgetting the peasant-women with their knick-nacks; Sunday street scenes in the old town of Cavan; the bridges and market-place of Athlone, a walled town standing by the banks of the Shannon; streets in the Gladdagh, the oldest portion of Galway on the west coast, the home of a peculiar mixed race of Spanish and Irish; views of the Lakes of Killarney, the Gap of Dunloe, an extensive peat bog at the summit of the gap, the Danish weir bridge at Torc Lake, and Muckross Abbey, with its luxuriant ivy; Glenariff on Bantry Bay, and the ruins of Blarney Castle.

Fine views were shown of Carnarvon Castle in Wales, one of the most imposing mediæval fortresses to be found in Great Britain; the mists rolling down from the summit of Mount Snowdon; a Welsh village, Dolgelly, and a typical Welsh cottage; in Stratford-on-Avon the house and memorial building of Shakespeare, and the church in which he is buried; Kenilworth Castle, perhaps the finest baronial ruin in England; Warwick Castle, remarkably ancient, well-preserved and historically interesting; the "Great Tom" tower in Christ Church College, at Oxford; Ely Cathedral, with its castellated towers and finest early English Choir; Peterborough, with its Norman Cathedral; Lincoln, quaintest of English towns, with its ancient dwellings and grand cathedral in the most superb decorated style—on the whole perhaps the most interesting cathedral in England.

The exhibition closed with several views of the "Lake District," including the old church at Grasmere and the grave of Wordsworth.

About ninety-five views were shown in all.

At the close of the exhibition, Counselor James J. Dean said he believed he was but voicing the pleasure of the audience when he offered a vote of thanks to Professor Spaulding for the exceedingly instructive and entertaining journey they had taken with him in Ireland, Wales and England, and all at the professor's expense!

This motion was seconded and passed without a dissenting voice, and the Section then adjourned.

INFORMAL MEETING, OCTOBER 16, 1889.

THE meeting was under the leadership of the Vice-President of the section, who introduced each person on entering the reception-room, and so all felt free to unite in friendly and social intercourse. Thus an opportunity was given to those who had only known each other by reputation to become personally acquainted. As this social phase of the meeting appeared to be heartily enjoyed by all, the chairman did not announce the appointed topic until the evening was more than half spent in conversation on a variety of photographic subjects of special interest to the parties who introduced them. Among other subjects, the new developing agent, eikonogen, and film negatives came in for a share of attention, and the experience of several who had used them was related and commented upon. There appeared to be none, however, who had not met with a number of objectionable features in their experiments with films. All, however, expressed the hope that the manufacturers of these films would so improve upon all their former work, that there could be no valid reason why they should not come into general use.

The merits of the aristotype paper were also discussed, and the best formulas for toning it; also a brief history of its origin by Professor P. C. Duchochois.

The value of flash-light pictures was also introduced, and excellent examples were shown by F. H. Flandermeyer and O. G. Mason. Those by the last named were finely printed proofs from 11 x 14 negatives, and were regarded by all worthy the highest praise. Mr. Thomas Faris exhibited a number of beautiful proofs made by a process now employed in the Kurtz gallery. These prints were from negatives exhibiting the crystallization of a combination of salts of

which Mr. Faris claims to be the originator and which he holds as a secret process. Truly this class of pictures may be reckoned among the novelties and esthetics of photography, and in course of time, no doubt, will find a niche in the temple of decorative art.

Immediately after the examination of these pictures, Mr. J. B. Gardner read the following paper:

At our last annual dinner which occurred on the third of September at the Hotel Brighton, Coney Island, I was expected to respond to the toast "Our Photographic Section, its object and uses, together with a brief summation of its history." But as there were representatives present from almost all branches of the art, I gladly give place to them, with the promise that what I had to say concerning the section, I would say at some one of its semi-monthly meetings during the present season.

Without further apology then for occupying a brief portion of the time this evening I will endeavor to redeem that promise.

This Section is an adopted branch of the American Institute. At the time of its adoption, some thirty years ago, it was mostly composed and controlled by amateurs who formed and organized the first photographic society in the City of New York, and probably the first in this country. From the time it became a branch of the American Institute, to the present, its chief office, that of the president, has been filled by amateurs. Its first was the distinguished astronomer, Lewis M. Rutherford. Its second, Professor John W. Draper. Its third, Professor Charles A. Joy, of Columbia College. Its fourth and last, our esteemed Henry J. Newton. Only four presidents in thirty years! A good example, perhaps, for our United States Government to follow.

(To be Continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—O. L. Y. writes: Would you please inform me, through the columns of the BULLETIN, if there is any method by which albumen films could be separated from the paper without destroying the film? Do not care if paper is destroyed if the films can be saved.

A.—We do not know of such a process. We believe there was a method practiced some years ago in which special paper was coated with albumen that could be stripped, but the process was a secret one, and we do not know that it is now practiced.

Q.—J. W. M. encloses two prints and writes:

I have tried the new developer hydroquinone, and have not been successful. The prints I inclose were from negatives made at same time and developed respectively with pyrogallol and hydroquinone, both solutions being prepared in accordance with the "Stanley" formula herein inclosed. In every trial with the "new" the film became softened, swollen and corrugated, and in one instance it moved off the glass. Can you give the why and wherefore?

A.—Judging from the prints we think you have used too much alkali with the hydroquinone and have not allowed the development to go on long enough. Hydroquinone is much slower than pyrogallol, and the density comes only by giving the plate time in the developer.

Q.—E. C. P. writes: I would be obliged if you would inform me, through the BULLETIN query column, where I may obtain collodion emulsion prepared, or directions for preparing the same with developer formulas, etc. Also if the Roche collodion emulsion for lantern slides could be used for portrait work under a skylight.

A.—The collodion emulsion of T. C. Roche is given in the "International Annual" for 1889, page 423. It works admirably for lantern slides and transparencies, but is not quite quick enough for portrait work under the skylight unless considerable time is given in the exposure.

Q.—A. S. writes: I have precipitated the gold in old toning baths with sulphate of iron, and redissolved this again with muriatic and nitric acid, but this gold will not tone. When I try to neutralize it with bi-carbonate of soda, no matter how little soda I use, it will precipitate the gold immediately. Will you kindly inform me in the columns of the BULLETIN what is the best way to utilize this gold? Will you kindly tell me what becomes of the gold used in toning, as the gold precipitated is much less than was used in toning?

A.—It is possible that the precipitate produced with iron does not contain enough gold to be useful. After dissolving in acids, you should evaporate nearly to dryness, and then, after dissolving in water, add enough sodium bi-carbonate to make it alkaline. The gold in the toning bath is taken up by the picture, otherwise it would not be toned. As a rule old toning baths do not contain enough gold to make it worth while to save it; that is, if they are used properly.

Q.—S. C. P. writes: Can you tell me whether or not there is such a thing in this country as a "circulating library of photo-

graphic books," excepting such as may be connected with photographic associations and simply for the use of such societies? Any particulars you can give me in regard to this will be received with special thanks. Can you also give me the addresses of a few of the leading English publishers of photographic books or those from whom a complete list of English books on photography can be obtained?

A.—We do not know of such a library. Columbia College has lately added a large number of books on photography to its library, and they can be used, subject to certain conditions, by residents of New York City. The following English publishers have lists of works on photography: Henry Greenwood and Sons, 2 York street, Covent Garden, London. Piper & Carter, 5 Fumival street, London. E.C. Iliffe & Son, 3 St. Bride street, London. E.C. Macmillan & Co., Publishers, London.

Views Caught with the Drop Shutter.

WE regret to note the death of Mr. EDMUND McLoughlin, of the firm of McLoughlin Bros., the juvenile book publishers of Brooklyn. He died at his residence in Brooklyn, of Bright's disease, after an illness of four weeks. He was fifty-six years old, and leaves a widow, two sons and two daughters. Mr. E. McLoughlin, to the writer's knowledge, was always a great patron of photography; his firm were the first to use photography commercially in connection with their numerous publications, and were the first in the United States to use relief plates

etched on zinc from photographic negatives. The photographic art has lost a good friend.

MR. W. V. RANGER, of Syracuse, the Vice-President elect of the Photographers' Association of America, called at our office on his way home from Washington.

DR. JOHN H. JANEWAY, the well-known amateur photographer and surgeon in the United States army, gave us a call lately. The doctor is still as enthusiastic as ever in photographic work. We regret that his duties will soon call him away from New York to his post in California.

MR. DAVID TUCKER, of the well-known firm of Tucker & Butts, the photographic merchants at Buffalo, has been compelled by ill health to give up active business work, and there is now an excellent opportunity for a good business man with about \$15,000 to enter one of the best firms in the country. We understand that the capital need not be all cash, if properly secured. The firm is well established and the business a thoroughly good one; we know of no better opportunity for a young and enterprising man to become established as a photographic merchant.

W. H. LEESON, the genial demonstrator of the M. A. Seed Dry Plate Company, gave us a call lately.

"SUN AND SHADE," the photographic art journal of America, is again on our table filled with interesting examples of photo-gravure. It contains an excellent portrait of Miss Catherine Lorillard Wolfe, and another of Henry George.

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YELLOWSTONE NATIONAL PARK

Yellowstone National Park
Geological Survey
Washington, D. C.

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View of the Grand Canyon of the Yellowstone River, looking north from the mouth of the river.



View of the Grand Canyon of the Yellowstone River, looking south from the mouth of the river.

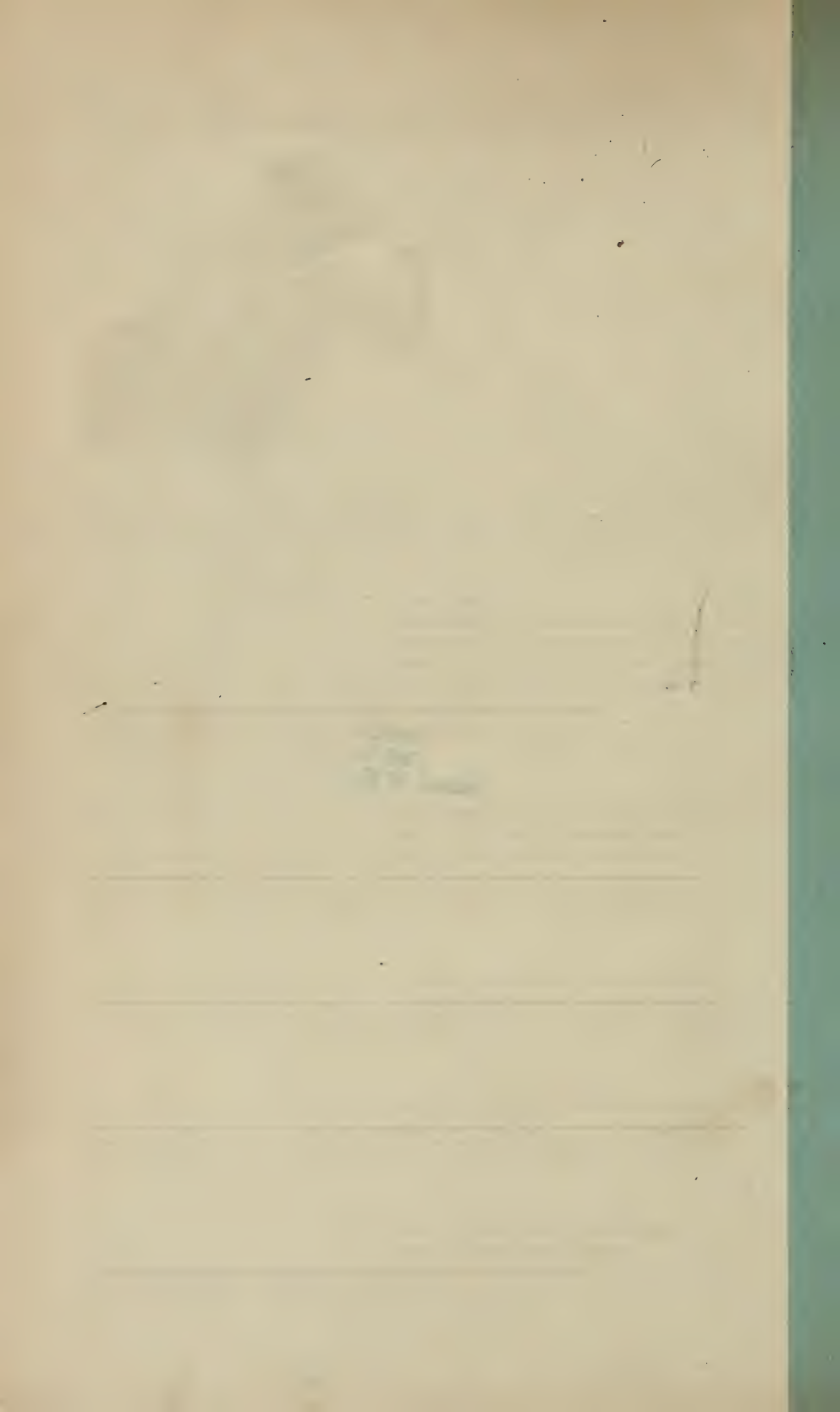
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"PLAYED OUT."

PRINTED ON N. P. A. EXTRA BRILLIANT ALBUMEN PAPER.



ANTHONY'S Photographic Bulletin.

Prof. **CHARLES F. CHANDLER**, Ph.D., LL.D., *Editor*.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

NOVEMBER 9, 1889.

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EOSIDE OF SILVER PLATES.

THE researches of Dr. H. W. Vogel in the use of color-sensitive (ortho-chromatic) plates have been so persistent, and have stimulated so many other workers, that it is now a very common practice in Europe to use this kind of plate. In Germany such plates are made and used by thousands, while here in the United States there seems to be very little done in this direction. Perhaps this may be due to the fact that up to the present time ortho-chromatic plates of the quality obtainable in Germany were not to be found in the American market. We are very glad to learn that this is no longer the case; but that our publishers now have ortho-chromatic plates (eoside of silver) made expressly for them according to Dr. Vogel's latest formula. These plates are from a remarkably fine emulsion and give the most interesting and useful results.

It has often been a surprise to us that American photographers did not take hold of this advance in photography and use color-sensitive plates. For portrait work they give the most beautiful results and require very much less retouching than is the case with ordinary bromide of silver plates. In the matter of landscape work, and especially during these beautiful autumn days, with red and golden foliage in the view, there is no comparison between the picture taken with an eoside of silver plate and an ordinary gelatine plate.

With eoside of silver plates the details in the distance, the fine effects of clouds, the gradations of light and shade in the hues of the foliage, are all rendered with a faithfulness approaching that of the steel engraver when he gives value in black and white to the colors of the artist's canvass. In the ordinary gelatine plate it is only under the most favorable circumstances, and with extreme care in developing, that both distance and foreground can be well preserved in a landscape negative. Cloud effects have to be caught and developed with a view to their special preservation, the rest of the view often being sacrificed that these may be retained; while in the rendering of the various shades of red and orange of an autumn landscape, the ordinary dry plate gives an absolutely reversed view of the tints as seen by the eye, the reds and yellows coming out darker than the greens with which they are intermingled.

Another application of these eoside of silver plates comes in the taking of portraits and groups where the subjects are dressed in costumes of bright colors.

How tame an ordinary photograph looks under such circumstances! With color-sensitive plates the colors are reproduced in black and white in gradations that are reasonably near the pleasing contrasts of color that delight the eye in the scene upon such occasions. The brilliant costumes often seen in our ballrooms are unsightly objects in a photograph with the ordinary plate; while with eoside of silver plates, they present variations of light and shade that are quite faithful to the originals, and only need the touch of color to give them all the beauty of the original. With groups this is still more strikingly apparent, the difference in the use of the ordinary and the color-sensitive plate being overwhelmingly in favor of the latter. Photographs from color-sensitive plates, tinted in water-colors, are totally unlike those from ordinary plates and are exceedingly beautiful.

We have said enough to indicate the usefulness of these new plates. It only remains for us to state that they are not ordinary gelatine plates bathed in coloring matters like eosine or erythrosine. Both of these are good sensitizers as far as they go, but their range of usefulness is quite limited. The eoside of silver plates are made by specially preparing the emulsion with the coloring matter in it, the latter forming an integral part of the sensitive material upon which the image is impressed. Now that the plates are obtainable we can only add that our readers should try them and judge for themselves as to the character of the results obtained by this latest advance in the preparation of gelatine emulsion.

EDITORIAL NOTES.

IN the September number of the *Bulletin de l'Association Belge de Photographie*, just received, we note two remarkable pictures of a cloud of smoke produced at the explosion of the cartridge factory at Antwerp. As our readers may remember, this explosion occurred on the sixth day of September last, and the factory being situated near some petroleum storage tanks, these caught fire, adding greatly to the devastation, and to the misery of the results. It happened that Mr. Huybrechts was using his detective camera near the scene of the accident at the moment when it took place, and with remarkable presence of mind caught a picture of the great white cloud of smoke that rose in the air. The original negative was only 8 x 10 centimeters—the enlargements for the reproductions in the *Bulletin*, above referred to, being made by M. L. Van Neck, and these measure about 12 x 15 centimeters. The cloud has somewhat the form of a wheat sheaf, and its height, calculated from the original negative, was about 1,014 metres (1107 yards), with the greatest width of about 568 metres (620 yards). Quite a number of other views of the disaster have been taken by the members of the Antwerp Section of the Belgian Association of Photographers, and these are to be reproduced in phototype, bound in an album, and sold for the benefit of the sufferers from this terrible accident.

WE recently had the pleasure of examining a number of detective camera pictures made by Mr. Charles F. Smillie, of New York, during one of his late trips into California. These were remarkable in the beauty of detail obtained in both foreground and distance, and certainly speak well for the excellent skill of Mr. Smillie. He has kindly promised to give an account of his method of working in the "International Annual" for 1890, which is already taking shape.

WE note with great pleasure that Professor H. A. Rowland, of Johns Hopkins University, Baltimore, has been elected a Fellow of the Royal Society of England, an honor conferred upon few men, and held by only two or three Americans. We congratulate Professor Rowland upon receiving such distinguished recognition from the oldest and most conservative of English scientific bodies. His photographic work upon the solar spectrum is, beyond question, one of the greatest achievements of modern times.

THE Jamestown (N. Y.) Camera Club has been organized with the following officers: *President*, Williams Bailey; *Vice-President*, S. Winsor Baker; *Secretary*, Clifton B. Gates; *Treasurer*, Lewis B. Kent. There will be a prize contest on January 1st next.

PROFESSOR S. W. BURNHAM visited us during his short stay in New York previous to sailing with the eclipse expedition. He carries with him a number of films for negatives, but relies upon glass plates for the more important work upon the solar eclipse.

DR. H. CARRINGTON BOLTON recently gave a lecture before the Brooklyn Institute, and exhibited a number of lantern slides made from negatives taken on celluloid films in the Peninsula of Sinai. Dr. Bolton gave a very interesting account of his travels and spoke very favorably of celluloid. Having to travel for days upon the backs of camels, he found the new substitute for glass a great advantage on account of its lightness, and the pictures obtained were remarkably good, in many cases being of great beauty. In quite a number of difficult cases where there were strong contrasts of light and shade the negatives were very good, and gave excellent lantern slides with good detail in the shadows.

ALVAN CLARK & SONS have just completed a new telescope for Harvard Observatory, to be used in star photography. It covers a space in the heavens about ten degrees square, and has a lens about eight inches in diameter. This new addition to the resources of the observatory is paid for out of the Draper fund, which has already done such excellent service for stellar photography.

WE have on our table several numbers of the new *Revue Suisse de Photographie*, the organ of the amateur photographers of Geneva, Lausanne, and Zurich in Switzerland. It is handsomely printed and finely illustrated, being published under the editorial direction of Dr. E. Demole, of Geneva.

[From Photographisches Wochenblatt.]

ILLUMINATION OF STUDIOS.

BY E. KIEWNING.

THE question, how can I regulate my light most suitably has certainly been asked by almost every professional photographer in the arrangement of his studio; how shall I place the curtains; and of what material and color are the latter to be to obtain the best results?

I will try to discuss these questions, having repeatedly had opportunity during the last few years to collect experience in many studios.

The first consideration should be to remove all disturbing reflections, which could not be avoided in the fitting up of the studio. This can be done in dif-

ferent ways. The glass, for instance, should be coated with a mixture of chalk and milk. This is particularly advantageous in the case of the top-light, as this latter may effect the most injurious disturbances.

If the studio is openly located, which is generally the case in the larger cities where most of the photographic studios are in the upper part of the house, it should not be neglected to shut off all sunlight by a careful construction of awnings and practically arranged blinds, giving, thus, during the busy hours, only diffused daylight. Here rests the central point of all illuminations for photographic studios. But how many times do we sin against this. Blinds deserve decidedly the preference, not only on account of their durability, but also in regard to the considerably more steady light which is produced by the same. Schaarwächter, for instance, keeps the rays off by blinds which have a flap offering no resistance to the wind when open, but shutting off the sun absolutely when closed.

Reflections from opposite buildings can easily be counteracted by coating the side light with chalk and milk, but in cases where this is not sufficient, a protecting screen, made of a frame covered with muslin, and painted gray on the inner side, should be fastened in an inclined position on the outside. It must be sufficiently high to catch all reflections from opposite buildings. An angle of 40 to 50 degrees will have sufficient effect in most cases without taking away any useful light; on the contrary, it will contribute to obtaining a steady diffused side light. Studios situated towards the street can use the outside of this inclined screen for signs, etc. I saw this arrangement in the new studio of Schaarwächter, and can recommend it where circumstances require such an arrangement.

In a studio whose side light is only 1.20 to 1.50 m. high (and there are a good many of that size), and where the strongly slanting glass roof joins the side light in a curve, such disturbing side reflections need not be feared if the low side light is covered with curtains. Such studios are in that direction the most advantageous ones.

Where the construction is such that reflections do not exist, although this is very seldom the case, the above arrangements may be dispensed with; but at all events it is advisable to have an eye upon the quantity of the light entering from the side, so as not to injure the harmony of the portrait to be produced.

There are a good many operators working cleverly with a front light and obtaining mostly good results; but the side illumination cannot be spared entirely, and care should be taken to produce the same as steady as possible, the equality of the results being supported thereby. It should also be considered that nothing excites the sitter more than an abundance of blinding light on entering the operating room, forcing him to close the eyes. But if proper care is taken to subdue the light we may hear the expression: "You have an agreeable light in your studio, having a pleasing effect to the eye." The comfort manifested by such an expression has a lasting effect upon the sitter while his picture is taken, and, of course, is of great advantage to the operator.

Even in studios situated on the ground floor, and exposed to all kinds of reflections, the above described protective arrangement is of advantage, throwing a good diffused light into the gallery in place of the unsteady or weak side light.

So much for the side light, which, produced according to this instruction, is by all means good, and should meet all requirements.

We come now to the question: How can the curtains be arranged? Of all

arrangements which I have seen, I consider the following the most practical: The whole construction carrying the curtains should not be too high, as the effect of their movement can thus be easier observed. The curtain moves best in the longer direction of the studio; brass wires, at certain distances, should carry the curtains running on rings. The curtain should not be too long, about $1\frac{1}{2}$ to, at most, 2 m., to obtain more conveniently the desired illumination. At both ends they should have a suitable rod sewn in, thus considerably facilitating their manipulation.

The arrangement of the side curtains is made in the same manner, that is not as hitherto mostly customary, to draw from below to the top, but likewise in the long direction of the gallery, and in such widths that three of the same are capable of shutting off the full height of the light space. The curtains here also run on wires and rings.

The question of what material and color the curtains should be is not answered so easily.

Schaarwächter chooses the usual dark blue material, which for years has been known to photographers, and is mostly in use; but to moderate his manner of illumination he has fastened over the dark curtains white ones in the same manner, and according to requirement he applies one or the other, or combines both if necessary.

Friedrich Müller, in Munich, uses exclusively a light gray, yellowish muslin for his curtains, and obtains in this way his well-known artistic pictures.

Ludwig, in Magdeburg, whose studio is exceptionally high and large and entirely covered with corrugated glass, uses curtains very seldom, enjoying the advantage that his studio is on the ground floor, adjoining a high building towards the south, so that the sun's rays can never enter.

Höffert operates in his business with quite white, transparent mull, or gauze curtains. Kameske, in the Hague, uses very little top-light; he has a very high, straight side-light, and applies for his illuminating effects a dark blue material.

Schueren, in Antwerp, lights his effective portraits with the aid of curtains of light blue material, arranged close to the background in very small widths.

Quite a number of efficient photographers I could still mention who differ in the selection of the material, and a definite rule for the same seems to be therefore excluded. It will be wisest to make arrangements according to circumstances.

If the studio is so situated that it possesses already much light, a darker material will offer more advantages, and will admit of more plastic effects than could be produced with a purely white material.

[From *Photographisches Wochenblatt*.]

THE TANNING OF CHLORIDE OF SILVER GELATINE PICTURES.

BY F. STOLZE.

THE use of chloride of silver gelatine paper has lately become more and more familiar, particularly among amateurs. In comparison with albumen paper and its particular manipulation the former is so convenient that its substitution cannot be wondered at. Of course, it has still certain defects, to which may be added the circumstance that in the ordinary treatment the gelatine film remains always somewhat sticky, so that the finished pictures cannot be dried between

blotting paper, or be mounted in a moist condition, like albumen paper prints. The effort to remove this defect is therefore certainly justified.

E. Vogel has lately recommended a hardening of the finished picture with tannin for this purpose, and as a disagreeable coloring of the film results, he adds sulphite of soda and muriatic acid to the bath, so that sulphurous acid is liberated, which, by its bleaching effect, prevents the coloring of the film. This bath, indeed, meets the promises of the inventor. But certain considerations connected with the same should also not be concealed. In the first place, the strong smell of sulphurous acid from the liquid is very obnoxious, irritating the breathing organs to coughing, and the bath itself is not very constant. If used in an open dish, which is unavoidable, the largest part of the sulphurous acid escapes, and the bleaching action ceases. The bath can, also, not be kept for repeated future use.

The question therefore arises why ordinary or chrome alum cannot be applied in place of tannin. If a test is made in this direction it will be found that the pictures treated in that way will show a yellowish coloration in the white parts after drying. If acetate of alumina is used in place of the alum, this coloration is particularly striking, and the strong acid reaction of this salt points to the fact that the acid plays a part in the yellow coloration. Here we find at the same time the means to be applied.

Make a solution of chrome alum, 1:100, add ammonia in drops until the light green precipitate, which first forms, disappears again while shaking. The liquid will now become intensely green. If a persistent muddiness remains, the bath should be decanted or be cleared by filtering. The ready washed pictures should remain in this bath from one to three minutes, and are washed once in clean water. They may now be treated exactly like albumen paper prints—dried between blotting paper, mounted moist, etc. The whites are fully preserved in the bath, while the latter can be kept for some time and has no disagreeable smell. The additional labor which arises is very little, and is sufficiently balanced by the very much easier treatment of the pictures in mounting and drying. To this may be added that tanned pictures resist much better all moisture and the handling with fingers, and the pictures squeezed after tanning will keep their gloss much better.

It is also to be remembered that the tanned pictures should not be left to dry before they are squeezed, but that the latter manipulation should be taken in hand at once after the final washing, provided that a high gloss is to be obtained. A film which is tanned in such a way can also easily be retouched; only care has to be taken that the brush is thoroughly dry.

For these reasons we can recommend fully the application of the neutralized chrome alum bath for gelatino chloride pictures.

(From *Photographen Zeitung*.)

CELLULOID PLATES.

BY DR. RICHARD JACOBY.

It is hardly necessary to pass any remarks about the inconvenience, etc., caused by the application of glass as a carrier of the sensitive film. The weight of the plates and their fragile nature are such mighty defects that for a long time already experiments have been made to replace such a doubtful material. It seems now that recently the right principle has been found in the application

of celluloid. Like so many great inventions, this one is also due to the Americans, who, after a long and tedious study, succeeded in producing a suitable celluloid, and thus solved the problem of coating the sheets with emulsions free from any blemish or defect.

The largest photographic house in the United States, E. & H. T. Anthony & Co., of New York, proceeded at once with the production, and already to-day, hardly a year after the first publication of the novelty, the excellent product of this world-renowned house, the Climax negative film, is distributed through all countries where photography is known.

The significance of these celluloid films will be so apparent to the readers of this paper that a short history, from the lips of such an authority as John Carbutt, will doubtless prove interesting.

The endeavor to replace glass dates back from eight to nine years. The Rev. Mr. Palmer, in Liverpool, was one of the first who tried to apply gelatine. Ferrier, in Paris, tried gelatine and collodion put together, but without any results. Later on gelatine was again tried exclusively, by bleaching the same with sulphurous acid before coating; these films were not sufficiently tough. Since about four years Carbutt himself had the idea to try celluloid, and commenced to work with the same, but was advised afterwards that he had a predecessor in the person of T. C. Roche, in New York, who had already furnished samples to E. & H. T. Anthony & Co.

The principal difficulty in the production of suitable celluloid plates was caused, mainly, by the camphor they contained. But this has already been overcome. There are only two factories in the United States which make such celluloids, and, until June, these could furnish sheets without defect to only a size of 21 x 26 cm. Now, with the assistance of expensive machines, they can produce sizes to 50 x 125 cm.

That the price is considerable, under such circumstances, is not to be wondered at; but this may also be reduced in course of time.

To obtain the celluloid only the very finest bleached white tissue paper is used and nitrated. It is afterwards worked with camphor, formed into a large ball, left to evaporate, cut afterwards into thin disks, these being placed in suitable forms and flattened out. The forms are then put into a press, through which, for six weeks, air is pumped. After this the material is carefully assorted and rubbed to give it a fine matt surface.

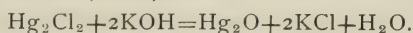
THE CHEMISTRY OF MERCURY AND ITS SALTS, AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

** Continued.*

MERCUROUS CHLORIDE.

THE alkaline hydrates (potassa, soda), and those of barium and calcium, precipitate mercurous oxide (black):



Potassium cyanide precipitates metallic mercury with formation of mercuric cyanide:

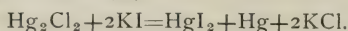


On this action is based the intensifying process of Mr. Carey Lea, by a weak

* Cy, abbreviation for CN, cyanogen.

solution of potassium cyanide—1 or 2 grains to the ounce of water. Should a strong solution be employed the opacity would be weakened.

If the bleached image be treated with a solution of potassium iodide, mercuric iodide is formed and mercury precipitated. The former tinges the image yellow (Maxwell Lyte process, 1853):

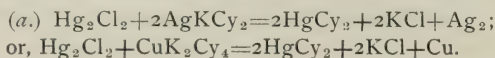


Another and very excellent process devised by Mr. Adolphe Martin (1861) consists in treating the bleached image—which is formed of mercurous chloride and argentic chloride, as before stated—with either of the following compounds:

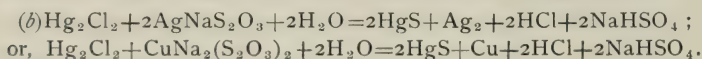
(a) A solution of double cyanide of silver, or copper and potassium, prepared by saturating a solution of potassium cyanide 1 to 20 with silver or copper carbonate freshly precipitated, whereby mercury cyanide is formed and silver or copper precipitated.

(b) A solution of silver or copper, sodium thiosulphate (hyposulphite), prepared in a similar manner, converts the mercury into sulphide, while the metal Ag or Cu is thrown down.

These actions are represented in the following equations:

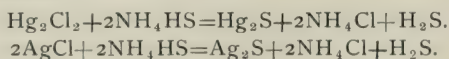


The actions are probably more complex, ammonia being evolved.

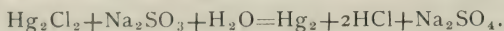


These last equations explain the greater intensity obtained by the second method.

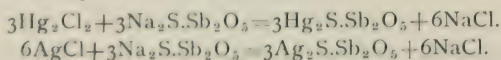
With ammonium sulph-hydrate (ammonium hydrosulphate)—a process much employed for line work—both mercurous chloride and silver chloride are converted into sulphides :



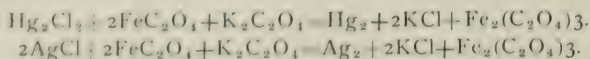
The intensification by the sulphites is not as great as by the processes above described, but is better adapted for portraits. Mercury being precipitated, thus :



The method of intensifying by sodium sulphantimonate (Schlippé salt), introduced in 1864 by Mr. Carey Lea, gives excellent results, with a great increase of intensity, if needed. The mercurous sulphantimonate formed is orange, and the argentic salt a brownish black, which becomes brown in drying. The negatives intensified by this process are termed “scarlet negatives.” The chemical changes are represented as follows : *



Lastly, the bleached image can be intensified with potassium ferrous oxalate (N. Chardon), in which case mercurous chloride and argentic chloride are precipitated to metallic state :

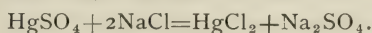


The intensification by this and the other described processes can be repeated several times, commencing with the mercuric salt, to obtain a greater intensity.

The image intensified by mercuric iodide,* the double cyanides or ferrous oxalate, may be further treated with a solution of pyrogallol and silver nitrate to the same purpose, or, after bleaching only, by an alkaline solution—without bromide—of pyrogallol, hydroquinone or other reducing agents. The latter method is due to Thos. Sutton, 1871.

MERCURIC CHLORIDE, HgCl_2 (Bichloride of Mercury, Corrosive Sublimate).

Mercuric chloride is prepared in the arts by subliming a mixture of mercuric sulphate and common salt in equal parts :



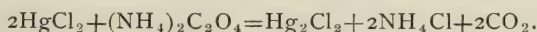
It occurs, then, as an inodorous white crystalline mass. It melts at 265 degrees, boils at 295 and 300 degrees C., and crystallizes without water of crystallization in colorless rhombic needles. Its taste is styptic and its reaction acid.

It dissolves in sixteen parts of cold water and two parts of boiling water, in two and a half parts of alcohol and four parts of ether.

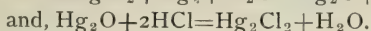
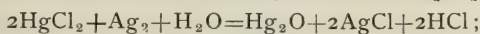
In moist air, mercuric chloride decomposes under the influence of light, evolving oxygen with formation of mercurous chloride and hydrochloric acid :



and in presence of ammonium oxalate, according to the following equation :



Many metals transform it into mercurous chloride or precipitate metallic mercury, being chlorized : Antimony, arsenic, zinc, cadmium, bismuth, iron, nickel, tin, copper, silver, but not gold. With copper, mercury is precipitated and amalgamates. Not so with silver ; the black oxide compound is first formed, and, the action proceeding, all the mercury becomes Hg_2Cl_2 ; thus :



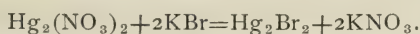
Mercuric chloride is precipitated by aqueous ammonia as mercurammonium chloride, NH_2HgCl , a white powder externally employed in skin diseases, ring-worms, etc.

Albumen forms with mercuric chloride an insoluble precipitate. Hence its use as an antidote. According to Peschil, 4 grains of the poison are precipitated by the albumen from the white of one egg.

Its use in photography has been explained.

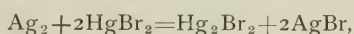
MERCUROUS BROMIDE, Hg_2Br_2 (Sub-bromide of Mercury, Mercury Monobromide).

Mercurous bromide is obtained by precipitating a mercurous salt by an alkaline bromide :



It is a white powder, insoluble in water, alcohol and ether, volatile below a red heat, and acted on by light.

Its properties are analogous to those of mercurous chloride. It results from the reducing action of metallic silver on mercuric bromide:



and gives rise to similar actions, thus : It is precipitated by aqueous ammonia as a black powder, dimercurous ammonium bromide, $\text{NH}_2\text{Hg}_2\text{Br}$; reduced as

* Not to the yellow stage. A simple wash with a dilute solution of mercuric iodide in the potassium salt.

Hg_2S by ammonium sulph-hydrate ; as metallic mercury by the alkaline sulphites, etc., and on this account sometimes substituted for Hg_2Cl_2 in photography on the suggestion of Dr. Von Monckhoven (1880).

MERCURIC BROMIDE, HgBr_2 .

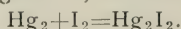
Mercuric bromide is formed when mercurous bromide is dissolved in a mixture of bromine and water. It crystallizes in white needles soluble in water, alcohol and ether.

In its properties it is analogous to mercuric chloride, from which it is distinguished by forming no precipitate with potassium chromate. This compound only precipitates the mercurous salt bright red, Hg_2CrO_4 .

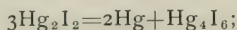
It is employed in photography as above stated.

MERCUROUS IODIDE, Hg_2I_2 .

To prepare pure mercurous iodide—*i. e.*, free from mercurousmercuric iodide—eight parts of mercury are triturated in a porcelain mortar with a little alcohol, and five parts of iodine are added in small quantities. When the product has assumed a uniform greenish yellow color it is washed with alcohol and dried at a temperature of 30 degrees C., in artificial light:



Mercurous iodide is a greenish-yellow powder, very sensitive to the action of light. It darkens rapidly, being reduced to mercury and mercuric iodide. "But," observes Dr. Eder,* "as alcohol extracts no mercuric iodide from the mercurous iodide blackened in the light, it stands to reason that Hg_4I_6 (after Boullay) must form. Then is the decomposition equation for exposed mercurous iodide:



that is, it divides into finely separated metallic mercury, which produces the coloration and dimercuric mercurous iodide. The blue and violet rays have here particular effect, as shown by Chastaing."

Mercurous iodide is insoluble—so to speak—in water, alcohol and ether ; not acted on by hydrochloric and sulphuric acids ; converted into mercuric iodide and nitrate by hot concentrated nitric acid, and decomposed into mercury and mercurousmercuric iodide, Hg_4I_6 , which sublimes when strongly heated. This compound is yellow.

Potassium iodide instantly decomposes it into mercury and mercuric iodide.

The alkaline hydrates and carbonates throw down a black compound—mercurous oxide.

Aqueous ammonia transforms it into a black powder which parts with nearly all its ammonia by dissociation.

It should be kept in black bottles. In time it even decomposes in the dark.

MERCURIC IODIDE HgI_2 (Bin-Iodide of Mercury).

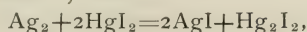
Mercuric iodide is the red, inodorous and insipid powder obtained by precipitating four parts of mercuric chloride in eighty parts of cold water, with five parts of potassium iodide in twenty parts of water, and washing the precipitate with small quantities of water until a solution of silver nitrate forms but a slight turbidity in the washing water.

* "Investigations on the Chemical Effects of Light." ANTHONY'S PHOTOGRAPHIC BULLETIN, Vol. XVI 1875, p. 477.

It is very little soluble in water ; soluble in one hundred and thirty parts of cold alcohol, in fifteen parts of boiling alcohol, acetic acid, potassium iodide, sodium chloride, sodium thiosulphate (hyposulphite) and ammoniacal salts.

Mercuric iodide is dimorphous. Crystallized from its solution in absolute alcohol, acetic acid, potassium iodide, it occurs either as red octahedrons or in yellow rhomboidal prisms, both crystals being often formed together.

It is acted on by light. Iron and copper reduce it to mercurous iodide, then to metallic mercury by the action of heat. Zinc and tin reduce it to metal ; lead and silver to mercurous iodide ; these changes are similar to those taking place with mercurous chloride ; thus :

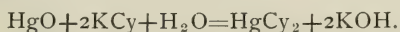


It is on this action is based the intensifying process of Maxwell Lyte by a solution of mercuric iodide in potassium iodide. The image first blackens slightly, then becomes yellow.

MERCURIC CYANIDE, HgCy_2 .

Mercuric cyanide is obtained by boiling two parts of potassium ferrocyanide with three parts of mercuric sulphate in twenty parts of water. It crystallizes in anhydrous quadrilateral prisms, soluble in 12.8 parts of cold water, three parts of boiling water, 14.5 parts of cold, and five parts of hot alcohol. Nitric and sulphuric acids, the alkaline hydrates and carbonates, do not attack it. Hydrochloric acid and hydrogen sulphide decompose it with evolution of hydrocyanic acid ! It is the most poisonous of the salts of mercury.

Mercury has a great affinity for cyanogen. It decomposes all the cyanides, even that of potassium :



MERCURIC SULPHIDE, HgS (Cinnabar, Vermilion).

Mercuric sulphide is found native as Cinnabar. In powder it constitutes the vermilion of commerce.

It presents itself in two isomeric forms. When mercuric chloride is precipitated from its acid solution by sodium thiosulphate it is thrown down as a black precipitate ; but if the solution be neutral, and remains so, it is red.

Mercuric sulphide is insoluble in water and in alcohol. Hydrochloric acid transforms it into mercuric or mercurous chloride, according to its concentration and the duration of its action. Hydrogen sulphide is evolved and sulphur liberated. Hydrobromic and hydriodic acids act in the same manner.

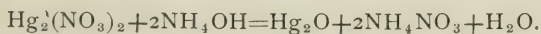
Silver nitrate colors it black from formation of argentic sulphide. Copper, at common temperatures, decomposes it, being sulphureted.

In the light cinnabar blackens without change. This phenomenon occurs more rapidly when the sulphide is exposed to the luminous influence in a solution of the alkalies or of ammonium hydrate.

The mercurous sulphide is not known.

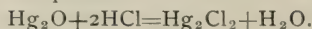
MERCUROUS OXIDE, Hg_2O (Black Oxide, Protoxide, of Mercury).

Mercurous oxide is prepared by precipitating mercurous nitrate with aqueous ammonia :



It occurs as a brownish black powder, quite insoluble in water, which light decomposes into mercury and mercuric oxide.

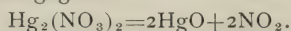
Hydrochloric acid attacks it according to the following equation, which shows that it is a definite compound :



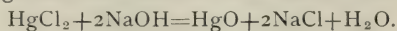
MERCURIC OXIDE, HgO (Binoxide of Mercury).

Mercuric oxide is obtained :

1. By heating mercurous nitrate, free from basic mercuric nitrate, until no more nitrous fumes are disengaged :



2. By precipitating mercuric chloride with caustic soda.



Obtained by the dry method, mercuric oxide forms a yellowish red crystalline powder, possessing a nauseous metallic taste and strong toxic properties. It scarcely dissolves in water, to which it imparts, however, an alkaline reaction.

It dissolves in hydrochloric, sulphuric and nitric acids, forming the corresponding mercuric salts. Heated above 400 degrees C resolved into oxygen and mercury, which partially oxidizes in cooling by absorption of the atmospheric oxygen. Exposed to light it is likewise decomposed.

It possesses energetic oxidizing properties. It transforms chlorine into hypochlorous acid and sulphurous acid into sulphuric acid. Mixed with sulphur and heated it explodes; with finely divided metals it oxidizes them with evolution of light.

Prepared by the wet method mercuric oxide occurs as an amorphous yellow powder, possessing generally the properties of the red oxide. It is, however, more rapidly blackened by light and distinguished by dissolving in oxalic acid quite easily, and by being transformed into white mercuric iodate by iodic acid, while the red oxide is not acted on.

REACTIONS.

All the salts of mercury rubbed on copper with a damp rag leave on the metal a brilliant reduction of metallic mercury, which disappears on heating.

They are all volatilized by heat. Heated with anhydrous sodium carbonate or potassium cyanide they give metallic mercury.

Mercurous Salts —The insoluble salts are resolved into mercuric compounds by boiling nitric acid.

The soluble salts are precipitated by the alkaline hydrates (potassa, soda) as black mercurous oxide, Hg_2O , which is decomposed into mercuric oxide, HgO , by heat. Ammonium hydrate and the carbonate form a black precipitate of mercurousammonium salt.

Hydrogen sulphide and ammonium sulph-hydrate produce a black precipitate consisting of mercury and mercuric sulphide soluble in aqua regia *only*, $\text{Hg}_2\text{S} = \text{HgS} + \text{Hg}$.

The soluble salts are generally distinguished by hydrochloric acid and the soluble chlorides, which yield a white precipitate of calomel, which turns black by addition of ammonium hydrate and the caustic alkalies.

Mercuric Salts. —The insoluble salts dissolve generally in nitric or sulphuric acid.

Potassium hydrate produces in the soluble salts a yellow precipitate, HgO , insoluble in excess. Ammonium hydrate produces a white precipitate soluble in excess.

Potassium iodide forms a red precipitate soluble in excess; with mercurous salts metallic mercury is thrown down.

Hydrogen sulphide and ammonium sulph-hydrate in small quantities produce a white precipitate, which, by excess, turns instantly black. This action is characteristic.

LENSES FOR HAND OR DETECTIVE CAMERAS.

BY J. TRAILL TAYLOR.

[Before the English Convention.]

A HAND camera implies the extreme of rapidity in its action, as, unlike others, it is held in the hand during exposure instead of being supported on a stand.

To this end the lens must possess certain characteristics—a large angular aperture to ensure luminous intensity, and conjoined therewith a form by which the illumination will, as far as possible, be evenly distributed over the area of the plate. But a large aperture, while securing intensity and consequent rapidity, is unfavorable to other requisites, such as depth of definition, and must therefore be subject to limitation.

The acme of rapidity will be found in a portrait combination, but there are two objections to its employment in outdoor or landscape work. Its components being placed one at each end of a rather long tube, the illumination, great in the center, necessarily falls off rapidly towards the margin; and when to obviate this defect a stop is inserted, then not only is the special advantage of employing such a lens lost, but a positive evil, a flare spot in the center of the plates, is also imported, which becomes of an increasingly pronounced nature the more the aperture in the stop is reduced.

Still, this lens is invaluable for operations which are conducted in a weak light, or when the scene or subject is not spread over an extended area, but is confined mainly to the center of the plate. With a lens of this class the shutter must be driven with great rapidity, for as its angular aperture is, say, $f/4$, its intensity exceeds by four times that of the popular lenses which work at $f/8$, or squaring these apertures, as 16 to 64.

When employed with full aperture, its great light-transmitting power renders the portrait combination invaluable for many purposes. There is one use in particular to which it may be applied when fitted to a hand camera. In many of the narrow and dark courts and alleys of cities such as London, scenes of life, in no place else obtainable, are to be found almost at every door. Here, inversely speaking, the very aristocracy of low life and squalor are to be found rampant. But scenes such as these defy the best efforts of the ordinary detective camera, for, owing to the high walls and the narrowness of the courts, the light which reaches these doorways is too feeble to permit of ordinary instantaneous photography being practised with any measure of success. Here the portrait lens proves the friend in need; for, as I have proved amid the purlieus of Drury Lane, which stand proudly pre-eminent over all the slums of the metropolis, there is no scene which cannot be obtained by its agency, and whereas, on an open landscape scene, only a very limited portion of the field would be sharp, here, owing to the convergence of the subject and the well-known law of conjugate focus, the field on the sensitive surface is flat and the picture sharp up to its very margin.

Before dismissing the subject of the portrait combination as a means of securing snap shots, I would allude to the value of the invention of Piazzi Smyth, the late Astronomer-Royal for Scotland, for flattening the otherwise round field of a portrait lens when working at open aperture. It consists in inserting immediately in front of the sensitive plate a plano-concave lens of suitable curvature and dimensions, its concave surface to the front. Into the optics of its action I need not here enter, beyond saying that it prolongs the convergence of the marginal rays in so much greater ratio than the axial ones as to bring both center and margin to a

focus on the same plane, and thus solves the problem of a flat field with full aperture.

I here submit snap shots taken by a portrait lens to show its inconceivable rapidity when used a right.

The lens which of all others is most employed in detective cameras is that introduced by Professor Steinheil, of Munich, in 1865 or 1866. It is now manufactured by every optician, and is known by a hundred different names, to each of which the prefix "Rapid" is usually attached. Its component lenses are symmetrical, or nearly so, and its images are orthographic or rectilinear, or, in other words, non-distorted. Formed of two kinds of flint glass, instead of the usual flint and crown, it is aplanatic, that is, works without a stop with an aperture equalling usually one-eighth of its focus. When a larger aperture than this is employed it is not infrequently termed a Euryscope. Its superiority for landscape or group purposes over the portrait combination consists in its greater covering power with any given aperture.

It is with the smaller lenses of this class that we have mainly to do with hand cameras, and fortunately small ones are amenable to proportionately larger apertures than those of greater dimensions. I possess two paired lenses of this class, which are employed either in a binocular or one or other of my detectives, the apertures of which are $f/5.65$, the focus being 6 inches. The tubes of these particular lenses are unusually short, and hence the illumination is excellent, even at the margins. This leads me to speak of the effect of the length of tube in preventing equality of illumination. The longer the tube the more circumscribed will necessarily be the area of illumination, and rays transmitted obliquely through a tube are much more attenuated than central ones. An axial ray is all right, and it correctly represents the angular aperture of the lens; but in proportion to the obliquity of light from the object so does the intensity diminish, until at length it is cut off and total darkness results. Pictorial effect demands the equalization of the lighting. This may be effected by the insertion of a stop, not in this case to improve the marginal definition, but to subdue or diminish the lighting in the center.

But in all cases where a lens is mounted at opposite ends of a tube a sometimes distressing number of reflections are formed. Just take up such a lens and direct it to a gas flame and you will observe at least four images, and, in most cases, a fifth one, between the lens and the eye. Every such image impairs crispness, by which I mean intensity of illumination as against a contrasting blackness. The Americans have coined a name for this which they call "cutting," whence they term that such and such a lens cuts sharp—by which they mean that it gives sharp definition of a bright something as against something adjoining which is dark. Each and every reproduction of a luminous image between the lens and the focal plane means a lowering of the brightness of the subject all over the plate by the diminution of the darkness of the shadows, and this condition prevails no matter whether the lens is stopped closely down or is worked at full aperture. I am not now referring to a central flare-spot, which is caused by the posterior one of these reflections and which is easily prevented, but to the effect of these reflections over the whole surface.

It is this inevitable effect of having such a combination of lenses in a tube which led experienced opticians to speak of the superior pluck and brilliance of the image obtained by single achromatized lenses, and this leads us to consider the application of single lenses for detective cameras. That such a lense gives brilliance is shown in the foregoing remark. But it gives an equality of illumination surpassing that of all others of the doublet form, unless such doublet be considerably stopped down so as to cause the margin to be impressed by a ray equal to that by which the center is produced. I am not here taking into consideration the diminution of the light, caused either by its transmission obliquely through a circular hole or of its further attenuation by having, owing to its obliquity, to travel a greater distance than the central rays ere it reaches the margin of a plate, although I quite recognize these as well as the hypothetic loss caused by the oblique incidence upon the lens itself. The single lens, when skillfully con-

structed, can be made to work with a large aperture—much larger, indeed, than is necessary for many subjects in bright weather.

The one fault possessed by a single lens is that of inequality in its ratio of refraction from center to margin, producing thus an increasing compression of subject towards the sides of the picture. But in a landscape such distortion is not recognisable. What is all important in a small photograph, especially one intended for enlarging, is sharpness. There is no negative so distorted but what, in course of reproduction, the distortion may be eliminated. Not so, however, with those in which there is any falling off in definition. This cannot be cured. If the light permit, the distortion of a single lens may be minimised by bringing the stop nearer to the lens. There is no doubt that, as regards defining power and intensity of light, single lenses will answer quite well for hand cameras.

Another class of lens—the simple, non-achromatic lens made of one piece of glass only—is now being resuscitated for detective work. The main difference between an achromatic and non-achromatic lens in photography is this: In the former the visual and chemical foci are brought to a focus on the same plane, whereas with the latter there is usually a distance equalling a thirtieth of the focus between these foci; hence to obtain definition it is necessary, after making the image visually sharp on the ground glass, that the sensitive plate be placed, not on that focal plane, but on one a thirtieth nearer to the lens. By adopting this precaution a very excellent degree of sharpness may be obtained. For cameras in which the focus is fixed, or is effected by measurements and without a ground glass, there seems no reason why simple lenses may not be employed, nay, for that matter they are employed in hand cameras, and that, too, somewhat extensively, as witness the Kodak, Lilliput, and other American cameras, as well as some others in this country. The simple lens can undoubtedly be made to produce extremely sharp work, capable of being several times enlarged without much falling off. Owing to its very simplicity the simple lens possesses excellence *sui generis*; there are the fewest reflections from its surfaces, and it is thin, and therefore little absorbent of light. I have used such lenses a good deal, made by past-masters, such as Joseph Zentmayer, Thomas Ross, J. H. Dallmeyer, Steinheil, and Morrison, some of these constructed for tentative purposes, others commercially. While I do not recommend the employment of simple lenses on theoretical grounds, in practice they may be made to answer quite well. I here submit what may be termed the *reductio ad absurdum* of this class of non-achromatic lens, namely, the two glasses of my *pince-nez* stuck by sealing wax on perforated circles of wood which fit a mount. This objective, when proper allowance is made in the focussing, gives a sharp bright picture, free from distortion and works with a drop shutter.

CAPTAIN ABNEY'S ADDRESS TO THE BRITISH ASSOCIATION.

AS PRESIDENT OF SECTION A (MATHEMATICAL AND PHYSICAL SECTION.)

THE occupant of this chair has a difficult task to perform should he attempt to address himself to all the various subjects with which this section is supposed to deal. I find that it has very often been the custom that some one branch of science should be touched upon by the President, and I shall, as far as in me lies, follow this procedure. This year is the jubilee of the practical introduction of photography by Daguerre and Fox-Talbot, and I have thought I might venture to take up your time with a few remarks on the effect of light on matter. I am not going into the history of photography, nor to record the rivalries that have existed in regard to the various discoveries that have been made in it. A brand new history of photography, I dare say, would be interesting, but I am not the person to write one, and I would refer those who desire information as to facts and dates to histories which already exist. In foreign histories perhaps we English suffer from speaking and writing in a language which is not understood of the foreign people; and the credit of several discoveries is sometimes allotted to nationalities who have no claim to them. Be that as it may, I do

not propose to correct these errors or to make any reclamations. I leave that to those whose leisure is greater than mine. I have often asserted, and I again assert, that there should be no stimulus for the study of science to be compared to photography. Step by step, as it is pursued, there should be formed a desire for a knowledge of all physical science. Physics, chemistry, optics and mathematics are all required to enable it to be studied as it should be studied; and it has the great advantage that experimental work is the very foundation of it, and results of some kind are always visible. I perhaps am taking an optimist view of the matter, seeing there are at least 25,000 living facts against my theory, and perhaps not one per cent. of them in its favor. I mean that there are at least 25,000 persons who take photographs, and scarcely one per cent. who know or care anything of the "why or wherefore" of the processes, so far as theory is concerned. If we call photography an applied science, it certainly has a larger number who practise it, and probably fewer theorists than any other. He would be a very hardy man who would claim for Niépce, Daguerre, or Fox-Talbot the discovery of photographic action on matter. The knowledge that such an action existed is probably as old as the fair-skinned races of mankind, who must have recognized the fact that light, and particularly sunlight, had a tanning action on the epidermis, and the women then, as now, no doubt took their precautions against it. As to what change the body acted upon by light underwent, it need scarcely be said that nothing was known, and perhaps the first scientific experiment in this direction was made rather more than one hundred years ago by Scheele, the Swedish chemist, who found that when chloride of silver was exposed to light chlorine was given off. It was not till well in the forties that any special attention was given to the action that light had on a variety of different bodies, and then Sir John Herschel, Robert Hunt, Becquerel, Draper and some few others carried out experiments which may be termed classical. Looking at the papers which Herschel published in the "Philosophical Transactions" and elsewhere, it is not too much to say that they teem with facts which support the grand principle that without the absorption of radiation no chemical action can take place on a body; in other words, we have in them experimental proofs of the law of the conservation of energy. Hunt's work, "Researches on Light," is still a text-book to which scientific photographers refer, and one is sometimes amazed at the amount of experimental data which is placed at our disposal. The conclusions that Hunt drew from his experiments, however, must be taken with caution in the light of our present knowledge, for they are often vitiated by the idea which he firmly held, that radiant heat, light and chemical action, or actinism, were each of them properties, instead of the effects of radiation. Again, we have to be careful in taking seriously the experiments carried out with light of various colors when such colors were produced by absorbing media. It must be remembered that an appeal to a moderately pure spectrum is the only appeal which can be legitimately made as to the action of the various components of radiation, and even then the results must be carefully weighed before any definite conclusion can be drawn. No photographic result can be considered as final unless the experiments be varied under all the conditions which may possibly arise. Colored media are dangerous for enabling trustworthy conclusions to be drawn, unless the character of such media have been thoroughly well tested, and the light they transmit has been measured. An impure spectrum is even more dangerous to rely upon, since the access of white light would be sure to vitiate the results. Perhaps one of the most puzzling phenomena to be met with in photography is the fact that the range of photographic action is spread over so large a portion of the spectrum. The same difficulty, of course, is felt in the matter of absorption, since the one is dependent on the other. Absorption by a body we are accustomed, and indeed obliged by the law of the conservation of energy, to consider as due to the transference of the energy of the other wave-motion to the molecules and atoms comprising the body by increasing the vibrations of one or both. In the case where chemical action takes place, we can scarcely doubt that it is the atoms which in a great measure take up the energy of the radiation falling on them, as chemical action is dependent

on the liberation of one or more atoms from the molecule, whilst, when the swings of the molecules are increased in amplitude, we have a rise in temperature of the body. I shall confine the few remarks I shall make on this subject to the case of chemical action. The molecule of a silver salt, such as bromide of silver, chemists are wont to look upon as composed of a limited and equal number of atoms to form the molecule. When we place a thin slab of this material before the slit of the spectroscope we find a total absorption in the violet and ultra-violet of the spectrum, and a partial absorption in the blue and green, and a diminishing absorption in the yellow and red. A photographic plate containing this same salt is acted upon in exactly the same localities and in the same relative degree as where the absorption takes place. Here, then, we have an example of, it may be, the vibrations of four atoms, one of which at least is spectrum. The explanation of this is somewhat obscure. A mental picture, however, may help us. If we consider that, owing to the body acted upon being a solid, isochronous or partially so, with the waves composing a large part of the visible, the oscillations of the molecules and atoms are confined to a limited space, it probably happens that between the times in which the atoms occupy, in regard to one another, the same relative positions, the component vibrations of say, two of the atoms vary considerably in period. An example of what I mean is found in a pendulum formed of a bob and an elastic rod. If the bob be made to vibrate in the usual manner, and at the same time the elastic rod be elongated, it is manifest that we have a pendulum of ever-varying length. At each instant of time the period of vibration would differ from that at the next instant, if the oscillations were completed. It is manifest that increased amplitude would be given to the pendulum swings by a series of well-timed blows differing very largely in period; at the same time there would be positions of the pendulum in which some one series of well-timed blows would produce the greatest effect. In a somewhat similar manner we should imagine that the ethereal waves should produce increased amplitude in the swing of the atoms between very wide limits of period, and, further, that there should be one or more positions in the spectrum when a maximum effect is produced. (The effect of perfect and nearly perfect synchronism of one oscillation upon another is also to be found exemplified in my "Treatise on Photography," Text-Book of Science Series.) I would here remark that the shape of the curves of sensitive-ness, when plotted graphically, of the different salts of silver to the spectrum, have a marked resemblance to the graphically-drawn curves of the three color sensations of the normal eye, as determined by Clerk Maxwell. May not the reason for the form of the one be equally applicable for the other? I only throw this out as evidence, not conclusive indeed, that the color-sensitiveness of the eye is more probably due to a photographic action on the sensitive retina than to a merely mechanical action. That this is the case I need scarcely say has several times been propounded before. The ease with which a silver salt is decomposed is largely, if not quite, dependent on the presence of some body which will take up some of the atoms which are thrown off from it. For instance, in chloride of silver we have a beautiful example of the necessity of such a body. In the ordinary atmosphere the chloride is, of course, colored by the action of light; but if it be carefully dried and purified and placed in a good vacuum it will remain uncolored for years in the strongest sunlight. In this case the absence of air and moisture is sufficient to prevent it discoloring. If in the vacuum, however, a drop of mercury be introduced the coloration by light is set up. We have the chlorine liberated from the silver and combining with the mercury vapor, and a minute film of calomel formed on the sides of the vessel. Delicate experiments show that not only is this absorbent almost necessary, when the action of light is so strong or so prolonged that its effect is visible, but also when the exposure or intensity is so small that the effect is invisible and only to be found by development. The necessity for this absorbent is not far to seek. If, for instance, silver chloride be exposed to light in vacuo, although the chlorine atoms may be swung off from the original molecule, yet they may only be swung off to a neighboring molecule which has lost one of its chlorine atoms,

and an interchange of atoms merely takes place. If, however, a chlorine absorbent be present, which has a greater affinity for chlorine than has the silver chloride which has lost one of its atoms, then we may consider that the chlorine atoms will be on the average more absorbed by the absorbent than by the subchloride molecules. The distribution of the swung-off atoms between the absorbent and the subchloride will doubtless be directly proportional to their respective affinities for chlorine, and so for the other salts of silver. If this be so, then it will be seen that the greater the affinity of the absorbent for the halogen the more rapid will be the decomposition of the silver salt. This, then, points to the fact that if any increase in the sensitiveness of a silver salt is desired it will probably be brought about by mixing with it some stronger halogen absorbent than has yet been done. The question as to what is the exact product of the decomposition of silver salt by the action of light is one which has not yet been fully answered. For my own part, I have my strong beliefs and my disbeliefs. I fully believe the first action of light to be a very simple one, though this simple action is masked by other actions taking place, due to the surroundings in which it takes place. The elimination of one atom from a molecule of a silver salt leaves the molecule in an unsatisfied condition and capable of taking up some fresh atom. It is this capacity which seemingly shrouds the first action of light, since when exposure is prolonged the molecules take up atoms of oxygen from the air, or from the moisture in it. Carey Lea, of Philadelphia, has within the last three years given some interesting experiments on the composition of what he calls the photo-chloride of silver, which is the chloride colored by light, and Professor Hodgkinson has also taken up the matter. The conclusions the former has drawn are, to my mind, scarcely yet to be accepted. According to the latter experimentalist, the action of light on silver chloride is to form an oxidized sub-salt. This can hardly be the case, except under certain conditions, since a colored compound is obtained when the silver chloride is exposed in a liquid in which there is no oxygen present. This coloration by light of the chloride of silver naturally leads our thoughts to the subject of photography in natural colors. The question is often asked—when photography in natural colors will be discovered? Photography in natural colors not only has been discovered, but pictures in natural colors have been produced. I am not alluding to the pictures produced by manual work, and which have from time to time been foisted on a credulous public as being produced by the action of light itself, much to the damage of photography and usually to the so-called inventors. Roughly speaking, the method of producing the spectrum in its natural colors is to chlorinize a silver plate, expose it to white light till it assumes a violet color, heat it till it becomes rather ruddy, and expose it to a bright spectrum. The spectrum colors are then impressed in their natural tints. Experiment has shown that these colors are due to an oxidized product being formed at the red end of the spectrum and a reduced product at the violet end. Photography in natural colors, however, is only interesting from a scientific point of view, and, so far as I can see, can never have a commercial value. A process to be useful must be one by which reproductions are strictly made; in other words, it must be a developing and not a printing process, and it must be taken in the camera, for any printing process requires not only a bright light, but also a prolonged exposure. Now, it can be conceived that in a substance which absorbs all the visible spectrum, the molecules can be so shaken and sifted by the different rays that eventually they sort themselves into masses which reflect the particular rays by which they are shaken; but it is almost—I might say quite—impossible to believe that when this sifting has only been commenced, as it would be in the short exposure to which a camera picture is submitted, the substance deposited to build up the image by purely chemical means would be so obliging as to deposit in that the particular size of particle which should give to the image the color of the nucleus on which it was depositing. I am aware that in the early days of photography we heard a good deal about curious results that had been obtained in negatives, where red-brick houses were shown as red and the blue sky as bluish. The cause of these few

coincidences is not hard to explain, and would be exactly the same as when the red-brick house were shown as bluish and the sky as red in a negative. The records of the production of the latter negatives are naturally not abundant, since they would not attract much attention. I may repeat, then, that photography in natural colors by a printing-out process—by which I mean by the action of light alone—is not only possible, but has been done, but that the production of a negative in natural colors from which prints in natural colors might be produced appears, in the present state of our knowledge, to be impossible. Supposing it were not impracticable, it would be unsatisfactory, as the light with which the picture was impressed would be very different from that in which it would be viewed. Artists are fully aware of this difficulty in painting and take their precautions against it. The nearest approach to success in producing colored pictures by light alone is the method of taking three negatives of the same subject through different colored glasses, complementary to the three color sensations which together give to the eye the sensations of white light. The method is open to objection on account of the impure color of the glasses used. If a device could be adopted whereby only those three parts of the spectrum could be severally used which form the color sensations, the method would be more perfect than it is at present. Even then perfection could not be attained, owing to a defect which is inherent in photography and which cannot be eliminated. This defect is the imperfect representation of gradation of tone. For instance, if we have a strip graduated from what we call black to white (it must be recollected that no tone can scientifically be called black and none white) and photograph it, we shall find that in a print from the negative the darkness which is supposed to represent a gray of equal mixtures of black and white by no means does so unless the black is not as black nor the white as white as the original. The cause of this untruthfulness in photography has occupied my attention for several years, and it has been my endeavor to find out some law which will give us the density of a silver deposit on a negative corresponding with the intensity of the light acting. I am glad to say that at the beginning of this year a law disclosed itself, and I find that the transparency of a silver deposit caused by development can be put into the form of the law of error. This law can be scarcely empiric, though at first sight it appears that the manipulations in photography are so loose that it should be so. It is this very looseness, however, which shows that the law is applicable, since in all cases I have tried it is obeyed. That there are theoretical difficulties cannot be denied, but it is believed that strictly theoretical reasoning will eventually reconcile theory with observation. This want of truth in photography in rendering gradation, then, puts it out of the range of possibility that photography in natural colors can ever be exact, or that the three negatives system can ever get over the difficulty. One of the reproaches that in early days was cast at photography was its inability to render color in its proper mono-chromatic luminosity. Thus, whilst a dark blue was rendered as white in a print—that is gave a dense deposit in a negative—bright yellow was rendered black in a print, or nearly so—that is, as transparent, or nearly transparent, glass in the negative. To the eye the yellow might be far more luminous than the blue, but the luminosity was in the photograph reversed. I need scarcely say that the reason of this want of truth in the photograph is due to the want of sensitiveness of the ordinarily used silver salts to the least refrangible end of the spectrum. Some fifteen years ago Dr. H. W. Vogel announced the fact that when silver salts were stained with certain dyes they became sensitive to the color of the spectrum, which the dyes absorbed. This at once opened up possibilities, which, however, were not at once realized, owing, perhaps, to the length of exposure required when the collodion process was employed. Shortly after the gelatine process was perfected, the same dyes were applied to plates prepared by this method, which, although they contained the same silver salts as the old collodion process, yet *per se* were very much more sensitive. A new era then dawned for what has been termed isochromatic and orthochromatic photography. The dyes principally used are those belonging to the eosin group and cyanin—not the ordinary cyanine dye of

commerce, but that discovered by Greville Williams. For a dye to be of use in this manner, it may be taken as an axiom—first propounded by the speaker, it is believed—that it must be fugitive, or that it must be capable of forming a silver compound. The more stable a dye is the less effective it is. If we take as an example cyanine, we find that it absorbs in the orange and slightly in the red. If paper or collodion stained with this coloring matter be exposed to the action of the spectrum, it will be found that the dye bleaches in exactly the same part of the spectrum as that in which it absorbs, following, indeed, the universal law I have already alluded to. If a film containing a silver salt be dyed with the same, it will be found that, whilst the spectrum acts on it in the usual manner—viz., darkening it in the blue, violet and ultra-violet—the color is discharged where the dye absorbs, showing that in one part of the spectrum it is the silver salt which is sensitive, and that in the other it is the coloring matter. If such a plate, after the exposure to the spectrum, be developed, it will be found that at both parts a deposit of silver takes place; and, further, when the experiment is carefully conducted, if a plate with merely cyanine-colored collodion be exposed to the spectrum and bleached in the orange, and after removal to the dark room another film containing a silver salt be applied, and then a developer, a deposit of silver will take place where the bleaching has occurred. This points to the fact that the molecules of a fugitive dye when altered by lights are unsatisfied, and are ready to take up an atom or atoms of silver, and other molecules of silver will deposit on such nuclei by an action which has various names in physical science, but which I do not care to mention. This is the theory which I have always advocated, viz., that the dye by its reduction acts as a nucleus on which a deposit of silver can take place. It met with opposition, a rival theory which makes the dye an “optical sensitiser,” an expression which is capable of a meaning which I conceive contrary to physical laws, being run against it. The objection to what I may call the nucleus theory is less vigorous than it has been, and its diminution is due, perhaps, to the more perfect understanding of the meaning of each other by those engaged in the controversy. To my mind the action of light on fugitive dyes is one of the most interesting in the whole realm of photography, as eventually it must teach us something as to the structure of molecules, and add to the methods by which their coarseness may be ascertained. Be the theory what it may, however, a definite result has been obtained, and it is now possible to obtain a fair representation of the luminosity of colors by means of dyed films. At present the employment of colored screens in front of the lens, or on the lens itself, is almost as essential in the method when daylight is employed; but not till some dye is discovered which shall make a film equally sensitive for the same luminosity to the whole visible spectrum will it be possible to make orthochromatic photography as perfect as it can be made. The very fact that no photograph of even a black and white gradation will render the latter correctly must of necessity render any process imperfect, and hence in the above sentence I have used the expression “as perfect as it can be made.” The delineation of the spectrum is one of the chief scientific applications to which photography has been put. From very early days the violet and ultra-violet end of the spectrum have been favorite objects for this photographic plate. To secure the yellow and red of the spectrum was, however, till of late years, a matter of apparently insurmountable difficulty; whilst a knowledge of that part of the spectrum which lies below the red was only to be gained by its heating effect. The introduction of the gelatine process enabled the green portion of the spectrum to impress itself on the sensitive surface; whilst the addition of various dyes, as before mentioned, allowed the yellow, the orange, and a portion of the red rays to become photographic rays. Some eight years ago it was my own good fortune to make the dark infra-red rays impress themselves on a plate. This last has been too much a specialty of my own, although full explanations have been given of the methods employed. By preparing a bromide of silver salt in a peculiar manner, one is able so to modify the molecular arrangement of the atoms that they answer to the swings of those waves which give rise to these radiations. By employing this salt of

silver to a film of collodion or gelatine the invisible part of the spectrum can be photographed, and the images of bodies which are heated to less than red heat may be caused to impress themselves upon the sensitive plate. The greatest wave-length of the spectrum to which this salt is sensitive, so far, is $22,000\lambda$, or five times the length of the visible spectrum. The exposure for such a wave-length is very prolonged, but down to a wave-length of $12,000$ it is comparatively short, though not so short as that required for the blue rays to impress themselves on a collodion plate. The color of the sensitive salt is a green blue by transmitted light; it has yet to be determined whether this color is all due to the coarseness of the particles or to the absorption by the molecules. The fact that a film can be prepared, which by transmitted light is yellow, and which may be indicative of color due to fine particles, together with an absorption of the red and orange, points to the green color being probably due to absorption by the molecules. We have thus in photography a means of recording phenomena in the spectrum from the ultra-violet to a very large wave-length in the infra-red—a power which physicists may some day turn to account. It would, for instance, be a research worth pursuing to photograph the heavens on a plate prepared with such a salt, and search for stars which are nearly dead or newly born, for in both cases the temperature at which they are may be such as to render them below red heat, and, therefore, invisible to the eye in the telescope. It would be a supplementary work to that being carried out by the brothers Henri, Common, Roberts, Gill, and others, who are busy securing photographic charts of the heavens in a manner which is beyond praise. There is one other recent advance which has been made in scientific photography to which I may be permitted to allude, viz., that from being merely a qualitative recorder of the action of light, it can now be used for quantitative measurement. I am not now alluding to photographic actinometers, such as have been brought to such a state of perfection by Roscoe, but what I allude to is the measurement and interpretation of the density of deposit in a negative. By making exposures of different lengths to a standard light, or to different known intensities of light on the same plate on which a negative has to be taken, the photographic values of the light acting to produce the densities on the different parts of the developed image can be readily found. Indeed, by making only two different exposures to the same light, or two exposures to two different intensities of light, and applying the law of density of deposit in regard to them, a curve is readily made from which the intensities of light necessary to give the different densities of deposit in the image impressed on the same plate can be read off. The application of such scales of density to astronomical photographs, for example, cannot but be of the highest interest, and will render the records so made many times more valuable than they have hitherto been. I am informed that the United States astronomers have already adopted the use of such scales which for the last three years I have advocated, and it may be expected that we shall have results from such scaled photographs which will give us information which would before have been scarcely hoped for. One word as to a problem which we may say is as yet only qualitatively and not quantitatively solved. I refer to the interchangeability of length of exposure for intensity of light. Put it in this way. Suppose with a strong light, L , a short exposure, E , be given, a chemical change, C , is obtained; will the same change C be obtained if the time is only an n th of the light L , but n times the exposure? Now, this is a very important point, more particularly when the body acted upon is fairly stable, as, for instance, some of the water-color pigments, which are known to fade in sunshine, but might not be supposed to do so in the light of an ordinary room, even with prolonged exposure. Many experiments have been made at South Kensington as regards this, more especially with the salts of silver, and it is found that for any ordinary light intensity and exposure are interchangeable, but that when the intensity of light is very feeble, say the one-millionth of ordinary daylight, the exposure has to be rather more prolonged than it should be, supposing the exact interchangeability always held good; but it has never been found that a light was so feeble that no action could take place. Of course, it must be borne in mind that the stability of the sub-

stance acted upon may have some effect ; but the same results were obtained with matter which is vastly more stable than the ordinary silver salts. It may be said in truth that almost all matter which is not elemental is, in time and to some degree, acted upon by light. I should like to have said something regarding the action of light and the iron and chromium salts, and so introduced the subject of platinotype and carbon printing, the former of which is creating a revolution in the production of artistic prints. I have, however, refrained from so doing, as I felt that the president of Section *A* should not be mistaken as the president of Section *B*. Photo-gravure and the kindred processes were also inviting subjects on which to dwell, more especially as at least one of them is based on the use of the same material as that on which the first camera picture was taken by Niépce. Again a dread of intrenching on the domains of art restrains me. Indeed, it would have been impossible, and certainly impolitic, in the time which an address should occupy to have entered into the many branches of science and art which photography covers. I have tried to confine myself to some few advances that have been made in its theory and practice. The discovery of the action of light on silver salts is one of the marvels of this century, and it is difficult to overrate the bearing it has had on the progress of science, more especially physical science. The discovery of telegraphy took place in the present reign, and two years later photography was practically introduced ; and no two discoveries have had a more marked influence on mankind. Telegraphy, however, has had an advantage over photography in the scientific progress that it has made, in that electrical currents are subject to exact measurement, and that empiricism has no place with it. Photography, on the other hand, has labored under the disadvantage that, though it is subject to measurement, the factors of exactitude have been hitherto absent. In photography we have to deal with molecules the equilibrium of whose components is more or less indifferent according to the process used ; again, the light employed is such a varying factor that it is difficult to compare results. Perhaps more than any other disadvantage it labors under is that due to quackery of the worst description at the vands of some of its followers, who not only are self-asserting, but often ignorant of the very first principles of scientific investigation. Photography deserves no have followers of the highest scientific calibre ; and if only some few more real physicists and chemists could be induced to unbend their minds and study the theory of an applied science which they often use for record or pleasure, we might hope for some greater advance than has hitherto been possible. Photography has been called the hand-maid of art ; I venture to think it is even more so the hand-maid of science, and each step taken in perfecting it will render it more worthy of such a title.

THE ENGLISH CONVENTION.

PRESIDENT PRINGLE'S ADDRESS.

(Continued.)

THERE is a name I have only mentioned casually as yet, but photography must never forget how much it owes to Abney. That scientist does not, I believe, claim to have initiated any absolutely new line of departure, but there is hardly a branch of our science on which he has not left a permanent mark.

Carey Lea's researches have been always valuable. And there is another friend of ours, a particular friend of my own, far distant, geographically, but doubtless present in spirit with us now. William K. Burton is young in years—still younger in photography—but he has brought to bear on photography a genius and an energy that have marked his footsteps wherever in our march he has trod.

And close to me is another landmark of photographic progress, not a landmark either, but rather a series of milestones. For a quarter of a century and more Traill Taylor has sat in the editorial chair, and taken cognizance of every event that has influenced our career ; and not a mere idle watcher

is Taylor, but an active helper, especially in the branch most congenial to his taste—optics.

I have endeavored to trace the astounding advances scientific photography has made during these fifty years. Artistic photography hardly permits of similar treatment. But I believe that our art has kept even pace with our science. We see many artistic photographs of bygone years just as we see many unfaded prints, but the average of artistic production has advanced just as the average of technique. Connected with the art education of photographers during these past years must ever be the name of Robinson; by precept and by example he has led us in the right way, even by provoking rivalry and eliciting contradiction he has served us, for his rivals have produced works that, with all their faults, will eventually work for the good of photographic art.

The questions I now venture to ask are searching ones, the answers I shall supply no less momentous if I reply correctly. Might we have advanced more rapidly in science and in art than we have done? I think we might. What have we lacked in past, and what do we require for future advance? *Training.* We require training in science and training in art. Mr. W. E. Debenham has stated, and Mr. C. H. Bothamley has corroborated the statement, and my wish is to emphasise it, that there is in our ranks a sad want, an almost total absence, of scientific methods of research and logical report of our investigations. We are not trained to scientific investigation; we lack the patience to eliminate *singularities* the causes of our variations in result; we jump at conclusions without safe ground to jump from. Photography is far behind every other science in this respect; papers such as we read and write would never be accepted or attended to by societies cultivating any other science, so far as I know.

So, too, in art, Mr. Robinson has said, Dr. Emerson has shouted, that we want art training. We trust to what we are pleased to call intuition; we despise and shirk study, or, what is far worse, we make no pretence of art, and shoot promiscuously with hand cameras at all and sundry over the face of the whole globe. If photography is to advance we must train ourselves to advance it.

Is there a mind anywhere incapable of finding work or pleasure or help in photography? Is it possible to find a being dead to every branch of our art-science? Surely our resources are wide enough. From the immeasurably great celestial bodies to the infinitesimal microbe everything visible is open to photography. Whatever the eye can see, aided or unaided, photography enables us to depict, and much that the eye cannot see photography will catch. Stars too dim, flight too rapid, wave vibrations too frequent or too far separate for our eyes to appreciate, are all within the recording power of photography. The lightning flash, the quiver of the insect's wing, the cloud-capped mountains, and the bowels of the earth, are all alike amenable to our science. Photography links together the past, the present, and the future; the absent with the present, the dead with the living. Fifty years ago what poor man had a portrait of his wife or children? What mother could look on a picture that reminded her of the features of a son in foreign lands? What lover could carry near his heart her portrait? Now, what cottage so lowly as not to have its portrait album, rude though the portraits and rough the album? Art, or, if you prefer it, portraiture, was then for the prince or the plutocrat, it is now for all. This is not a small matter that photography has accomplished, and you and I have helped photography to bring it about.

What science is there that can dispense with photography? Certainly no practical science. The astronomer needs us, the mechanic needs us, the microscopist calls on us, the physiologist and the pathologist appeal to us for help. The artist has learned many lessons of us, and will learn more. Truly, the influence and the use of photography are universal.

Every one now before me has adopted, or may adopt, some special branch of photography as a profession, as a recreation, or as an aid to some other science. To every one, therefore, I say train yourself to make the best of what you undertake; there is no necessity to undertake too much, but let us have no dabbling

nor smattering; make scientific experiments, reason logically from the experiments, and let the world have the benefit. Whatever we may do for photography, photography has done much more for us. There is an old proverb and a homely one, but I commend it to-night to your attention with all the force of which I am capable: "Whatever is worth doing is worth doing well."

A NEW SPECTROSCOPE SLIT.

At the meeting of the American Association for the Advancement of Science, held this year at Toronto, Mr. Hitchcock described a new form of spectroscope slit which had recently been made for him by Mr. W. H. Bulloch, of Chicago, the well-known maker of microscopes. The device was a combination of Mr. Lockyer's slit for making a succession of exposures of spectra on a single plate, with an adjustable wedgeslit for the study of absorption. Great credit was accorded to Mr. Bulloch for working out the plan in an ingenious and wholly satisfactory manner. Those who are engaged in spectrum work would do well to adopt this form of slit, as it meets all requirements and is not very costly.

THE NEW YORK CAMERA CLUB.

THE first public fall meeting of the New York Camera Club was held at the club rooms, No. 314 Fifth avenue, on the 25th of October, 1889.

The lecturer of the evening was E. D. Lindsey, the well known architect of this city, and who was for many years professor of architecture at Princeton College. The subject of his lecture was "A Sketch of the Evolution of the Styles of Architecture, and the Kindred Arts." Professor Lindsey had his subject well in hand, and gave a large amount of instruction in very entertaining form.

His theory was that architecture is an evolution whose every step can be followed with as great certainty as Darwin claimed for his evolution of species. Indeed, with greater certainty; for there are, according to Professor Lindsey, no missing links in the architectural progression. To carry out this idea, the lecturer commenced with slides showing the earlier specimens of Egyptian architecture. The tent, he said, was perhaps the first object copied by the builder—not the common single pole tent, but the tent erected with four poles—which was an outgrowth from, and an improvement on the original single pole tent, and was used by the chiefs, or prominent men, in the wandering tribes as they increased in importance and desired to draw the line of distinction between themselves and the mass of their followers. The slides chosen bore out the professor's theory in a very strong way. In alluding to the massiveness of Egyptian architecture, Professor Lindsey said that the Egyptian idea was a material eternity and concluded that, had it not been for the ravages of man, they would have succeeded in accomplishing their object.

While dwelling on Egypt, Professor Lindsey described the raising of the obelisk, which, according to his conception, was accomplished as follows:

A mound of earth, or sand, was erected near the pedestal on which the obelisk was intended to stand, and opposite the temple in front of which it was usually erected. The obelisk was then drawn upon this mound by man power, with its base toward the foundation, the corners being slightly rounded. The earth was then gradually excavated from beneath its lower extremity until it finally tilted down upon the base. Then, blocks and tackle were attached to the

upper end, and it was drawn into an upright position by men standing upon the walls of the gates of the temple opposite.

This was practically the method which Commander Gorringer afterwards used in transporting, lowering and erecting the obelisk which now stands in Central Park.

Greek art was, more or less, an outgrowth of the Egyptian, only that the Greek substituted for the massiveness of their neighbors the idea of artistic completeness. They wrought at their architecture as the sculptor at his art. The slides given showed the principal subjects of Grecian art.

The Romans, again, took their ideas of architecture from the Greeks. In the earlier days of the republic, it was as much the custom for a Roman to send his son to Athens to complete his education as it is now for a Chicago father to send his son to Boston. The Romans, however, aided by the Etruscan discovery of brick, and by their knowledge of the manufacture of cement, were able to construct greater masses than had any of their predecessors, and were also able to use the arch more frequently and to better advantage, which gave greater variety to their architecture. The Romans, among other new departures, put an ornamental base to their columns. With the fall of the Roman Empire all of the arts subsided, to take a fresh start only after many centuries.

The Byzantines and Saracens were successful masters of the arts of architecture, and the result of their two schools became, in northern Italy, the Romanesque.

The building of the great cathedrals of Milan, Cologne, Amiens and Paris brought about the revival of architecture; and Professor Lindsey exhibited, in a very striking manner, that the Gothic art was merely an evolution from what had preceded it.

His summary of the whole matter was that, if the art of architecture and its achievements could be obliterated from the earth, and mankind should begin all over again, the history of architecture would repeat itself.

The next public meeting of the club occurs on the second Friday evening of November, when, it is hoped, Professor Elmendorf will address the members.

OUR ILLUSTRATION.

THE excellent study with which we illustrate this issue of the BULLETIN is the work of Mr. Strauss, the well-known artist of St. Louis. It is one of those charming pictures of child life that captivates everyone, and tells its story in the sweet simplicity of the scene presented. Who has not noted just such an episode in the life of some little one near and dear to him? And how well the picture by Strauss recalls the lines of Mrs. Browning:

How he sleepeth! having drunken
Weary childhood's mandragore;
From his pretty eyes have sunk
Pleasures to make room for more.

It is not often that we have the pleasure of reproducing such an interesting and life-like study as the present frontispiece of the BULLETIN.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

BUFFALO, N. Y., October 29, 1889.

To the Editors of the BULLETIN:

THE Executive Committee for 1890 requests me to announce officially that they have chosen Tennyson's poem, "Enoch Arden," as the subject for competition for the Grand Prize.

The rules governing the collection of photographs will be the same as this year for "Evangeline."

They have made the selection thus early that those who intend to compete may have ample time to work up the subject.

H. McMICALH.

ANTHONY'S Photographic Bulletin.

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AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

INFORMAL MEETING.

(Continued.)

THE section throughout its entire history has been mostly patronized by amateurs; and by the labor of these, much valuable information has been published concerning the art.

One of the objects of the Section has been to encourage experimentalists both in the mechanical and chemical branches of photography. Hence any improvements in apparatus and chemical formulas have received due attention and their advantages and disadvantages freely discussed.

A record of these improvements has been duly recorded in the proceedings of the Institute as well as brief reports of the meetings published in the leading photo journals of New York and other cities. In fact, this Section has been one of the head centers of photographic news; and it is from sources like this that the journalists have gathered many of their facts and thus made their works valuable to all students of the art.

These records and reports have no doubt often been of comparatively little value to those who have never attended the meetings; for it often occurs that in order to fully appreciate these improvements, many explanations are required that never appear in print. And inasmuch as seeing a thing done is more impressive than simply reading a verbal description of it, so those who have been in the habit of attending these meetings have had a great advantage over such as depended upon simple reports. There is no doubt that the experience of those who have habitually attended these meetings is that there is a social feeling established that often leads to a friendly interchange of thought unattainable in any other way! Meetings of this sort bring together a great variety of talent in different branches of the art. One is gifted in all that pertains to its chemistry. Another, in its relations to art, and another, in its mechanical requirements. Hence, each may avail himself of the services of the others, and in this way learn in a few hours much that he might fail to obtain in a life-time, if wholly dependent upon his own individual labors.

The photographer who regards his art as a secret process, who withholds everything he knows from his co-workers, and talks only to conceal his knowledge, is not likely to win the friendship of his fraternity or profit much by any statement they are likely to make; for he will be inclined to regard their words as misleading as his own. If time would permit this might be illustrated with examples familiar to many of us, but perhaps it is quite sufficient to simply recall them to memory and pass them by.

There is so much that each photographer can impart to his brother, and so help him in a multitude of ways without the slightest injury to himself, that there is no excuse for undue secretiveness. That all branches of business, as all families, must have their secrets is a well-established fact, and it is only such as would pry into these secrets, and for the deliberate purpose of enriching themselves by the impoverishing of others, that should meet with a hearty rebuff and the just indignation of those they seek to injure.

The Photographic Section has been remarkably free from this class, and its members have been obliged to use no more imperative rule of order than the law of politeness and good will.

Where this law has shown itself the most conspicuously has been in the informal meetings of the Section.

It is hoped that these social gatherings during the coming season may prove more attractive than ever before, and accomplish much that can never be reached by formal popular instruction.

The evenings appointed for the informal meetings may very aptly be regarded as the reception nights of the Section. On these evenings it is expected that the official members, at least, will be present to receive all whose company has been solicited. In a city like New York, where there is so much to be done and where so many are pressed for time in the discharge of their business obligations, it becomes imperative that some special time should be set apart for the reception of their friends. Hence the members of the Photographic Section have chosen the third Wednesday evening in each of the winter months for their reception night, and will always be happy to meet any who are interested in photographic art, and who desire to enlarge their social relations among the members of their craft.

Various methods of conducting the regular meetings have been adopted from time to time, and all with more or less success.

It was thought at first that the Section could be made the most useful by the exhibition of novelties and by the discussion of subjects and processes more or less clouded in mystery. It was soon discovered, however, that those who were the most advanced in the secrets of the art and best qualified to teach, chose rather to be listeners to such as were more prolific in theories; so that those who practically knew the least usually talked the most! The one was talking that he might learn something from his opponent; the other kept silent, for fear he should divulge some secret of his success.

Another class made use of the Section for the purpose of finding some one who could help him in overcoming difficulties which the tyro seldom fails to meet, and when this was accomplished he had no further use for the Section, and so the Institute seldom increased its membership from this class of learners.

Novelties in photographic apparatus often attracted two distinct classes—one who was anxious to exhibit something whereby he might increase his notoriety; the other, that he might devise an improvement on notoriety's invention, and so eclipse the fame of his competitor. It only required the slightest variation to claim originality, and thus antipathies were engendered that made any one society too small for both these classes to permanently unite in. Thus the audiences of the

section have been like the ebb and flow of the tide. There are a few, however, who have unceasingly worked for it from its very beginning, and as one means failed to attract they have devised another, so that now they are convinced that not only novelties should be exhibited for public notice and criticism, but such discussions on photographic topics as may be useful to both the amateur and professional. Carefully prepared lectures, especially when illustrated, have proved the most popular for two or more seasons past. They have also attracted a greater variety of talent than when confined to extemporaneous debate.

It has not been the purpose of the Section for the past three years to treat photographic subjects in detail, but simply to note the general principles on which these details are evolved. In this way an intelligent idea of what photography is, and what it has accomplished, has been brought within the reach of, and made attractive to a large class who take little or no interest in the subject when presented in technical form. While the Section has been very much dependent upon the liberality of the Institute, and the generosity of those willing to contribute both their money and personal service, it owes much to the proprietors of our leading photographic stock houses for their valuable literary contributions and for their reports of the proceedings of its regular and informal meetings.

Photography is so intimately connected with other arts and sciences that the student in this art-science who would attain to the highest excellence is forced to know something of all the others with which his special study is more or less related.

Hence the Executive Committee of the Section has used its best endeavors to secure the services of both artists and scientists who might aid the photographer in the collateral studies of his art. By this means the character of our audiences has been materially changed; and in place of having only those interested in technical photography present, the majority has often been made up of professional scientists and artists. And it is from the influence of these meetings that many of these professionals have received their first aspirations to become amateur photographers. Some of whom have already joined the ranks and so added their influence in promoting and popularizing the art. In many photographic societies the cost of membership is an item to be considered; but in this, by the generosity of the American Institute, it has been made free to all. That this

privilege may be duly appreciated is the sincere prayer of all who have at heart the welfare and prosperity of an institution organized more than fifty years ago for the advancement of science and art.

What this Institute has achieved during the past half century would require the writing of many books, and it is only those who have been intimately connected with its interests that can ever fully appreciate the noble work it has accomplished.

Most of its founders and most earnest workers, now rest from their labors, and it is for their children to say how this American Institute is to keep pace with the spirit and temper of the age.

If this question is rightly answered, and the inheritors of this legacy prove true to their trust, there still remains a fame for it that may eclipse all its former glory and so render to the world a service not dreamed of in the past.

At the close of the reading, Mr. Gardner invited any who desired, to make such suggestions as might tend to increase the usefulness of the Section.

Professor Duchochois thought that the Section might gain something by following the example of some of the societies in the Old World, and institute a series of rewards for the best work, whether mechanical, chemical, artistic or literary.

Mr. Charles Simpson thought that if the rooms of the Section, as in some other societies, were open every evening, and the library at the disposal of all who desired to read, that the popularity of the Section might be greatly increased.

The Chairman then announced that the hour (10 o'clock) for closing had arrived, and he therefore declared the meeting adjourned.

BROOKLYN ACADEMY OF PHOTOGRAPHY.

On the evening of October 18th a general exhibition of lantern slides was given by the members of the Academy at the Hoagland Laboratory.

The collection consisted of photographs taken by members while on their vacations during the summer. The exhibition was very successful, and the members have reason to feel proud of the result of their efforts.

Among those who contributed were: Dr. John Merritt, Dr. J. H. Raymond, C. A. Bryan, Wm. Arnold, S. W. Lewis, H. S. Fowler, H. M. Eaton, F. A. Egerton, Wm. E. Osborn, Wallace G. Levison, Fred. M. Law-

rence, Geo. S. Wheeler, G. Poey, W. T. Wintingham, Frank LaManna, F. B. Mills and Wm. Wallace Tooker of Sag Harbor.

LYNN CAMERA CLUB.

A MEETING of the club was held at 40 Broad street, on October 22d, with a good attendance. It was voted to establish a new class of membership (social members), to be of such persons as are interested, but at time of application not actively engaged in the art of photography, but who wish to contribute to the support of the club in return for all the privileges of active membership except to hold office. It was also voted to establish a new office, that of corresponding secretary, and W. A. Porter was elected to fill the office until the annual election in January. A committee was appointed to prepare for an entertainment to be given by the club at an early date, the proceeds to be used in furnishing the new club house, now being erected at 42 Broad street.

It may be here stated that, as far as known, the Lynn Camera Club is the second in the country to have a special club house.

The following gentlemen were elected to active membership: Otis K. Stuart, J. W. Bowley, G. C. Hovey, E. P. Michaels and S. F. Breed.

A majority of the members are now thoroughly awakened at the prospect of such fine quarters, and a number of novelties are expected for the opening night, which will probably occur in November.

PHOTOGRAPHERS' AND ARTISTS' MUTUAL BENEFIT ASSOCIATION.

CONSTITUTION.

ARTICLE I.

Name, etc.

SECTION 1. This body is and shall be called Grand Council of the Photographers' and Artists' Mutual Benefit Association, and shall be composed of the persons who executed the certificate of incorporation, and all other persons who shall be eligible according to, and complying with, the Constitution and By-laws of said Association, and be duly initiated therein.

ARTICLE II.

Sessions.

SECTION 1. The Grand Council shall meet annually, on the second Monday in March, at

2 o'clock P.M., at such place as may be agreed upon at each preceding session, and shall continue to meet from day to day (except Sundays and legal holidays) until all the business before it is disposed of.

The place of meeting of the Grand Council shall be as a majority thereof may by ballot determine.

SEC. 2. The President of the Grand Council shall call special sessions thereof whenever he may deem it necessary, but five days' notice must be given thereof to each member of the Grand Council.

ARTICLE III.

Officers and Elections.

SECTION 1. The officers of said corporation shall consist of a President, Vice-President, Secretary, Treasurer and a Board of Trustees, to consist of five members, all of whom shall serve for a term of one year or until their successors are duly installed and qualified.

SEC. 2. Should vacancies occur among the officers by death, resignation or otherwise, during recess, the Board of Trustees, or a majority thereof, shall appoint a member of the Council to fill the vacancy, until the next session, regular or special, of the Council, when such vacancy shall be filled by election.

SEC. 3. The officers of said Grand Council shall be elected at the first session of said Council by the persons eligible to said Grand Council, as stated in Article I., Section 1, of this Constitution, and thereafter by those entitled to vote in this Council at the time prescribed in the order of business.

SEC. 4. There shall be appropriated, to pay the salaries of officers, the sum of five cents (5c.) from the initiation fee and monthly dues of each member of the Photographers' and Artists' Mutual Benefit Association, which sum shall be the maximum amount that can be taken for such purpose.

ARTICLE IV.

Quorum and Voting.

SECTION 1. A majority of the members of said Grand Council shall constitute a quorum.

SEC. 2. A majority of the legal votes of the members present, and entitled to vote, shall decide all questions in this Council, except amendments to the laws, appeals from rulings and decisions of the President, during recess or in any Council meeting, or expenditures or appropriation of moneys, to determine any of which shall require a vote of three-fifths of the members present and entitled to vote.

SEC. 3. Each officer and every member of said Grand Council (who shall not be legally

suspended from such Council and participation in its affairs, as provided by the code of procedure of said Council) shall be entitled to vote on every question.

SEC. 4. Voting herein shall be by ball, written ballot or voice, and the ayes and nays, when called for by two members, shall be taken and entered on the record, but votes for officers shall be by written ballot.

The President shall appoint three tellers when necessary.

ARTICLE V.

Code of Procedure, etc.

SECTION 1. The Grand Council may make such rules of order as may be necessary for the regulation of its sessions and for securing good order and dispatch of business.

SEC. 2. The Grand Council shall have power to adopt a code of procedure for the trial and punishment of members charged with offences against the laws of the Association.

SEC. 3. This Grand Council shall make such by-laws, rules of order and order of business, and code of procedure as it may deem expedient under this Constitution, and any by-law thereof conflicting herewith is hereby declared null and void.

ARTICLE VI.

Seal.

SECTION 1. This Council shall have an official seal having an appropriate device thereon.

ARTICLE VII.

Alterations and Amendments.

SECTION 1. Alterations and amendments to this Constitution may be made at any regular meeting of the Grand Council by a vote of two-thirds of the members present and entitled to vote at such meeting.

SEC. 2. The Grand Council may adopt such regulations and general laws as may be deemed necessary for the welfare of the Association, not inconsistent with the provisions of this Constitution, and alter, amend or abrogate the same.

BY - L A W S .

ARTICLE I.

Election of Officers.

SECTION 1. Any legal member present may nominate any eligible member for any elective office by open nomination.

SEC. 2. All legal members of the Grand Council (who have not been suspended according to law) shall be entitled to vote.

A majority of the votes cast shall be necessary for an election.

After the polls are closed the votes shall be counted by three members of the Council, appointed as tellers by the President, whose duty it shall be to announce the result of the balloting.

SEC. 3. Any member of this Council (who shall be in good standing and not suspended as provided by law) shall be eligible to any office in the gift of the Council after its organization and election of its first officers.

SEC. 4. The installation of officers shall be after the business of the session, at which the election takes place, has been completed.

All officers shall hold office from one session until the next, and until their successors are installed and fully qualified.

SEC. 5. Should any of the Council officers-elect fail to be present for installation, the President may install them as soon as possible thereafter.

ARTICLE II.

Duties of Officers.

SECTION 1. The President of the Council shall preside at all sessions of the Council ; enforce order and decorum ; decide all questions of order without debate, subject, however, to an appeal to the Council by two members ; appoint Council officers *pro tem.* in case of temporary absence of any of the Council officers ; sign all orders drawn upon the Treasurer for such sums as may be ordered by the Council, and sign all other papers as may require his signature to authenticate them.

He shall exercise a general supervision over the Association, appoint all committees not otherwise provided for, present and cause to be read his report at the session of the Council.

He shall call the Vice-President to the chair during the discussion of any question before the Council on which he may desire to speak. He shall, at the annual session, appoint the following committees :

1. On Laws and their Supervision.
2. On Appeals and Grievances.
3. On Finance.
4. On Science and Art.
5. On Printing and Supplies.

He shall, at the annual session, present a report of his acts during the recess of the Council.

He may exercise, as occasion may require, all the rights pertaining to his high office, in accordance with the laws and usages of the Association. He shall have a watchful supervision over all the affairs of this Association

and see that all the constitutional enactments, rules and edicts of the Grand Council are duly and promptly observed, and that the work and discipline of the Association everywhere are uniform.

He shall call special sessions of the Council when he deems it necessary.

He shall designate one of the officers of the Grand Council, residing in the State of New York, upon whom legal process can be served, in accordance with the laws of that State.

He shall approve of the bonds of the Trustees, and cause to be executed and to securely preserve and keep the official bonds and securities of all officers of this Council.

He shall discharge the executive functions of the Council in the interval between sessions.

It is hereby expressly agreed to be the law, that whatever the Council could do while in session, except elect officers, alter or amend the Constitution, the President, with a majority of the Board of Trustees, can do during recess.

He shall be ex-officio a member of all committees.

SEC. 2. The Vice-President shall assist the President and in his absence shall preside, and in case of the removal, death, resignation or inability of the President, that office and its duties shall devolve on the Vice-President.

SEC. 3. The Secretary shall keep a just and true record of all the proceedings of the Grand Council at each session ; he shall keep a true record of all members of the Association.

He shall preserve the archives, have charge of the seal, books, papers and other properties of the Grand Council, and shall deliver the same to his successor when qualified or when required to do so by this Council ; he shall officially notify all members of the Grand Council of all meetings thereof, and carry on all the necessary correspondence of the Council.

He shall, at each session, present to the Grand Council a report of the general condition of the Association ; receive all moneys due the Council and pay them over monthly to the Treasurer taking his receipt therefor, and keep a correct and true account of the same ; draw all orders on the Treasurer for such moneys as may be voted by the Council or as may be ordered by the President and a majority of the Board of Trustees in recess, and attest the same, besides all other official papers and documents ; he shall report in writing at regular sessions, and at any time when so required by the Council or Trustees, the condition of the funds of the Council ; he shall keep a record of all securities received by him from the Trustees and deposited by him with the Treasurer for safe keeping ; he shall

deliver the books to the Finance Committee whenever it may demand them; he shall give bond in the sum named by the Council or during recess by the Board of Trustees; his bond may be increased from time to time by the Council or its Board of Trustees.

(To be Continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—D. H. H. writes: I admire the picture of South Down Sheep in Central Park, made by Henry J. Newton. I wish to do similar work if I can, and I think others as well as myself would be much pleased to have from Mr. Newton a full description of the process employed, giving the exact manipulation and formulas used, and also the lense used and the equivalent focus of the lense. Please publish in BULLETIN.

A.—The original negatives were made upon glass $6\frac{1}{2} \times 8\frac{1}{2}$. Instantaneous exposures, with a 13-inch focus Aristoscope lense, and 1-16 diaphragm. These were developed with Newton's Giant developer. From these negatives reduced glass transparencies were made on plates of size to suit BULLETIN, and from these transparencies celluloid film negatives were obtained by contact printing in the camera, using a white card reflector for lighting. Films were also developed with Giant developer. See, also, other answer in this column.

Q.—J. Y. writes: I have just made some chloride of silver collodion, which has turned badly and become curdled like milk; can you tell me how to make it fit for use?

A.—In reference to this difficulty in making chloride emulsion, it is impossible to answer, as you do not send the formula used or your method of working.

Q.—M. H. S. writes: About how many 5×8 prints should be toned by the formula given with toning powders; should the used bath work by adding more gold after standing a few days or a week, or must a fresh bath be mixed for every batch of prints? I got good results the first time, six 5×8 prints, but the next time I could not get eight 5×8 prints properly toned in nearly three hours, although I added at different times about an ounce and a half more gold.

A.—Your explanation of your method of

working is not quite clear. The directions given with the powder answer all purposes. Perhaps you let the bath get acid, or it was too cold. Remember, to get the best results the toning bath should be tepid. Two grains of metallic gold will tone one sheet of albumen paper 18×22 if the bath is tepid and decidedly alkaline; but it must be remembered that too much water should not be added, or the time of toning will be greatly increased. About twenty minutes in the bath is ample time.

Q.—T. L. B. writes: Can you tell me where I can buy glue to make blocks by contact printing to be used in newspapers?

A.—We do not know where such glue can be obtained, but think any hard variety of gelatine might serve the purpose. It is probable that a mixture of several varieties, mixed to suit the character of the cuts to be produced, will be found best.

Q.—G. J. Van D. writes: In a number of places in the BULLETIN, and also in the "International Annual," "bromide of cadmium" is spoken of. Can you tell me which kind is meant, the commercial or the anhydrous? It would make quite a difference, I should think, in making up the collodion emulsion. I have been experimenting in that line, and would like to try some of the formulas, given. You speak of the collodion emulsion of T. C. Roche, given in the "Annual" for 1889, in the last copy of the BULLETIN. I have made three or four lots by that formula, and have had pretty good success. He states, add the bromide of ammonia to the alcohol and ether and shake until dissolved. I find no amount of shaking will cause it to dissolve. Can you give me the reason? I have sometimes made the solution by addition of water, and sometimes added the cotton before any solution of the bromide, and had pretty good success. I use a tannin preservative, and do not wash it off when using hydroquinone.

A.—An hydrous is generally used. It is considered about twice as strong as the ordinary commercial. If formula calls for commercial it should be used. Roche grinds up his bromide of ammonia, first in a mortar, with a little alcohol, then adds the collodion and shakes to dissolve the cotton. The less water added to collodion the better, as too much will throw down the cotton; it will also cause collodion to flow crapy or ropey. Any preservative will work well on Roche's Emulsion. He prefers plain coffee, say four ounces to the white of one egg, well beaten up, and flowed on twice.

Q.—E. F. T. writes: Why does the silver seem to come off the paper in such large quantities in the wash water before toning? It seems to literally slide off, and makes the water milk white. After several changes the silver is still seen on the surface of the paper like a sort of scum. Prints bleach very much in washing, and in toning there is no depth and richness in the shadows. Paper does not take a good burnish. I silver one and one-half minutes on 50 grains bath.

A.—This difficulty is probably due to the use of bad water. Water that contains a considerable amount of chloride of sodium (common salt) will act this way. Try washing in water made alkaline with ammonia, one fluid dram to the quart, and don't soak too long.

Q.—R. H. L. writes: Please tell me, through the columns of the BULLETIN, why my toning bath of gold and acetate of soda turns to a deep purple color after standing a day or more after use. How can this be avoided?

A.—The color is due to the precipitation of the gold by the organic matter from the albumen paper. We do not know any way to prevent it. Don't put more gold into the bath than is necessary to tone one batch of prints.

Q.—D. H. H. writes: I was trying Pizzighelli printing paper on an unvarnished negative, a negative which I valued quite highly, and the Pizzighelli paper stained the negative so that, in its present condition, it is worthless. I ask you if you can tell me what treatment, if any, would clear the negative from the stain from the Pizzighelli paper?

A.—Soak the negative in weak hydrochloric acid, 1 in 20, and wash well.

Views Caught with the Drop Shutter.

ANOTHER new photographic journal comes to us from Cincinnati. It is called *The Photographer*, and is edited by Dr. Arthur Le-Boutillier. The size is a small quarto of eight pages, issued monthly.

THE New York *Spellbinder* for September says that President Harrison's worst enemy about Deer Park, Md., is Rubicon Sears, the photographer. Rubicon went up to the cottage before the President left, and when Mr. Halford came to the door, he said:

"Are you the President?"

Mr. Halford hedged, then he coughed modestly, and said:

"No-o—that is, not yet."

"I want to see the President," said Rubicon.

"What for?" asked the secretary.

"I thought as I was going to take a picture of the house that I'd like to have the President swinging in the hammock. I wouldn't ask it, but I turned a hundred niggers up in the mines to vote for Harrison, and I haint asked any office."

"The President is engaged," said Mr. Halford, and no amount of persuasion on Rubicon Sears' part could prevail.

Rubicon was mad. He went to his tent, and drank a quart bottle of alcohol, and just before he went off on a snake hunt Rubicon swore, and said: "I'll make him lose a thousand votes for it." It is dangerous for even a President to cross a Rubicon.

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"TO THE KAISER"

FROM BOSTON CONVENTION 1889

H. M. MICHAEL.

PHOTOGRAPHED

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

NOVEMBER 23, 1889.

Vol. XX.—No. 22.

A MONUMENT TO DAGUERRE.

By a resolution passed at the Boston meeting of the Photographers' Association of America it was decided that the Association should invite photographers and others throughout the country to join with it in raising a monument to the memory of Louis Jacques Mandé Daguerre, the father of photography.

There is no doubt that a large number of both professional and amateur photographers will be glad to join in this laudable undertaking, and in order to give everyone a chance to contribute, it has been decided to invite subscriptions of one dollar to this fund. President McMichael, of Buffalo, has supplied us with a subscription book, and we shall be very glad to receive contributions from all interested in the work. These subscriptions will be announced from time to time in the columns of the BULLETIN, and a receipt for the amount will be mailed to each contributor.

We are satisfied that with so reasonable an amount to contribute, the fund will be a large one, and the pleasure of assisting in such a good work will be satisfaction enough to all interested in the art of photography. Let each and all unite to honor the man who has done so much to make our homes beautiful; who has given us the means of keeping before us fac similes of the faces of those absent and dear to us; who has made it possible for us

“ To hold, as 'twere, the mirror up to nature,”

and indelibly impress upon it the scene presented.

And it is not only in the way of pleasure and the satisfaction of our appreciation of the true and beautiful, but also from a purely utilitarian sense that we should unite to honor Daguerre. The new art started by the French scene painter has grown so marvelously that those who live by industries more or less dependent upon its application, are numbered by hundreds of thousands in every civilized country on the face of the globe. From the ferrotype worker to the more skillful artists that give us the gems that adorn the walls of our exhibitions; from the zinc etcher that illustrates our daily newspapers from the negatives caught upon our sidewalks, to the photo-gravure and half-tone workers that give us the beautiful illustrations of our art and monthly magazines, what a multitude of busy hands and brains are daily developing and perfecting the art started only fifty years ago. There is no doubt that photography has become an im-

portant factor in the progress and industry of every civilized nation, and those who are interested in it either from pleasure or profit should all unite to honor its founder. How pleasant it will be for the small artist to remember that he contributed to this fund in company with his more fortunate brother that owns a magnificent studio, and that his contribution is just as valuable for the object in view. Then let us all unite, let us each take a hand in raising such a monument to Daguerre that his mother-country may look on with admiration.

The monument, when finished, will probably be placed in the Smithsonian Institution at Washington. In such a situation it will be of national importance and be well taken care of. The present officers of the Photographers' Association of America have charge of the preparation of designs and will probably be ready to report some time in January next. It is therefore important that each subscription should be sent in soon in order that the design may be prepared according to the amount of the subscriptions. There will without doubt be a monument to Daguerre. Let us all see that it is worthy and in keeping with the appreciation of his work in the United States.

Subscriptions should be sent to the office of the BULLETIN, 591 Broadway, New York City. Send early and honor him to whom our art owes its birth and the brilliant future that appears before us.

EDITORIAL NOTES.

Mr. S. R. STODDARD, of Glens Falls, recently made a flash-light negative of the statue of "Liberty Enlightening the World" in New York Bay. We have not yet learned the result; but believe the operation was successful. We are indebted to Mr. Stoddard for an invitation to be present, but more pressing duties kept us from seeing this most interesting experiment. It will be remembered that Mr. Stoddard made a flash-light negative of the Washington Memorial Arch on Fifth avenue one night last spring, and the prints which we have show that he was quite successful. We hope that his experience at that time will help him to even better results upon the Statue of Liberty.

THE many friends of Professor W. K. Burton among the readers of the BULLETIN will be glad to hear of him. He has very kindly sent us a report of the Photographic Society of Japan, which appears on another page. The following extracts from a letter from him to the Secretary of the Camera Club (London) are also interesting:

"I have had very hard work through all the heat of summer, and am now established for a few days to recuperate on a little island, or rather isthmus, that bears the name Enoshima. I am established in the minutest house I think I ever saw, like a doll's house stuck in a niche at the top of one hundred steps in the face of a cliff, and looking down on the loveliest bit of sea and landscape that ever human eyes could gaze upon. I spend the time in getting down the steps to have a swim in the sea, lying on the mat smoking and reading, and in hammering away at my type-writer, which is absolutely the only piece of furniture that there is in the house, except the said mats. I am lightly and airily arrayed in a 'fundoshi,' which is, in truth, only a piece of somewhat broad tape wound around the waist."

* * * * *

"Various of my friends and myself have tried silver sensitizing by different methods of many kinds of Japanese paper, but with less success than we expected. In spite of its great beauty, there was always something wanting, due,

I believe, to want of regularity in the texture. Far the best results that I have seen have been got by an American on some very thin, almost transparent, silky paper, of which I should send you a sample were I at home.

"I quite agree with you about reform in printing matters. My own latest fad is rough drawing paper, printed with a wide margin. I think the results are very fine for any work 12 x 10 or larger. From 12 x 10 I print with an opening as nearly 12 inches long as the plate will allow, and about $8\frac{1}{2}$ inches wide. That is to say, for some subjects. Many, of course, need variation, both in shape and size of opening. I leave a margin to make the size up to about 16 x 11. The margin may be either tinted or white, as suits the subject. There is nothing new in this, of course, but I intend to write a bit about it, in the hope that some will be persuaded to try it."

As many of our friends desired to know how those beautiful portraits of Fr. Müller, which obtained the gold medal at Boston, were made, we wrote him about the matter. In reply, he says that the platinum paper was sensitized by him, and developed with hot oxalate solution.

THE Chicago Camera Club have recently sent us a handsome little *brochure*, containing the prospectus, by-laws, and a list of members of the club. It is neatly printed, contains two illustrations of the club's rooms, and several artistic little sketches in a humorous vein, making it a model of its kind.

ANOTHER unfortunate accident from flash powder occurred in Philadelphia on November 11th, killing three men and injuring several others. Wiley & Wallace, chemical manufacturers, on North Seventh street, had manufactured flash powder with various mixtures of permanganate of potash and bichromate of potash, and had become nervous about their presence round the factory. Wishing to get rid of the dangerous mixture, Mr. Joseph Wiley, a member of the firm, concluded to throw some mixture of this kind down the sink, and while he was handling it, the explosion occurred, killing him, together with Charles Rhinedollar, a chemist, and Rudolph Lippmann, an employee. William Kidd, another employee, was seriously injured, and may not live; while Alfred Moffatt, an engineer, was also badly hurt. A number of others were also injured. The moral of all this means: Don't use magnesium mixtures with oxidizing substances. Pure magnesium used in a flash lamp will give all the light necessary for any work of this kind, and is not explosive.

M. THOURONDE states that the small bubbles or blisters formed on dry plate negatives, when allowed to dry slowly, are due to the growth and development of bacteria—derived from the atmosphere. It is also possible that a similar cause may give rise to the imperfections and spots in celluloid films.

THE St. Louis Camera Club opened their new club rooms on Tuesday, November 5th, with a large attendance. The appointments of the new club house were subjected to careful inspection by all the visitors, the dark room receiving special consideration. It is provided with electric incandescent lights, which are inclosed in boxes having glass panels of the non-actinic colors. The dark room approaches are provided with black partitions, so set as to prevent any rays of

white light entering the dark stalls; but there are no inner doors to bar free entrance and exit.

THE Lynn Camera Club is the second in the country to build a club house especially for the use of amateurs. The building is 30 x 40 feet, two stories high, with flat roof. The second story is to be fitted for the use of the club, with 8 x 14 feet sky and side lights, and a fine dark room, which is 15 x 20 feet. The large hall with screen for slide exhibitions, will contain about nine hundred square feet, and will easily accommodate one hundred persons. The plan was prepared by E. L. Rogers, a member of the club, with special reference to the comfort and convenience of the members. The dark room will be fitted with lockers for the use of members, and will include all conveniences. The building is lighted throughout with incandescent electric lights.

ANDERSON, the well-known photographer, of Broadway, New York, has just completed another one of his gigantic composition photographs. This time it consists of the members of Lafayette Post No. 140, and numbers over three hundred portraits. It is only a little smaller than the great picture of the Seventh Regiment, also made by Anderson, which contained eight hundred and forty portraits. The picture of Lafayette Post took eight months in its production, and contains the portraits of some of the most prominent men in New York.

LETTER FROM GERMANY.

Photography at the International Exhibition in Paris.

BY DR. H. W. VOGEL.

I MADE a short trip to Paris, to take a look at the exhibition before its close. There has so much been said in praise of it, that a mild criticism, expressive of "nothing ever like it," would hardly be in order. It was, indeed, a sight to make one feel dazzled and confused. Everything is so luxuriously and tastefully arranged that one is taken completely by surprise. This, of course, applies also to the photographic division; although each country has its own exhibits scattered over the building, and one has difficulty in finding them all.

The largest of all is, of course, the French, and the luxury with which the photographers are exhibited here is worthy of admiration. Pavilions draped with costly oriental tapestry and carpetings, and adorned with magnificent Chinese and majolica vases, palms, rich armor, etc., have been set up in the large hall. The latter contains a fine top-light, but even this is surrounded by a sky of painted glass windows. There is a profusion of magnificent frames and cartoons, and many exhibits. For instance, the pavilion of Nadar must have cost thousands, in comparison with which the decorations of the Berlin exhibition look very modest.

Passing now from all this luxury to a closer examination of the photographic work, I must declare that the progress is not so great as might have been expected. Yes, I might even say that portrait photography, aside from the enlargements, shows no progress whatever.

In vain we look for Adam Salomon, who by his new style gave a fresh impulse to the art, and in vain we look for some new characteristic individuality.

What we find is the so-called fine picture. Everything nicely burnished, handsomely mounted on card-boards, glazed, enamelled, and heaven knows what else. More elegance than art. That recourse was had to new means, like the bromide of silver paper for enlargements, which we find here worked masterly with crayon, is, therefore, not to be wondered at. But, after a close examination of all the photographs during several days, I must confess that I expected more.

Even with photographic printing processes I have not been satisfied. The Paris art market supplies the heliographer and the zinco relief printer with so many orders that the highest might be expected from both. Firms like Goupil, (Boussod Valladon), retain their reputation. The latter works not only in photo-engraving, but also in color-zinco relief printing for the journals. After Goupil I would mention Dujardin, with his photo-engravings. This designation is quite arbitrary. Phototypy, photo-engraving, helio-engraving, heliography are used sometimes for this, and sometimes for that kind of work, and one is oftentimes embarrassed to recognize the character of the work.

Somewhat remarkable appears to me the Woodbury prints in the French division. Four firms had exhibited under the name of photoglypty and obtained silver medals. The unfortunate inventor received only a bronze medal in 1867.

Carbon pictures were prominent; particularly some very good enlargements—direct prints after enlarged negatives. Carette & Forgeot made in this respect quite a respectable exhibit; their brown-intensified negatives (with uranium?) of $1\frac{1}{4}$ -meter were faultless. The firm of Braun in Dornach, whose chief lives in Paris, and is domiciled in France, exhibited, of course, the products of their establishment in a grand style. Again there were pigment reproductions in which Braun proved his masterly superiority. Quite a respectable accomplishment is the picture of Van der Helst, the "banquet," length, nearly two meters; also, carbon pictures in two tones made with apparently two transfers. Cherry Rousseau, in Etienne, exhibited also similar colored carbon enlargements.

Burnt-in photographs were well represented, but not better than at the Paris Exhibition of 1878—particularly upon enamel by Deroche and Comte Roydeville. Both were restricted to small sizes only. Leisner's porcelain photographs would have had a decided effect in comparison with these.

In architectural photography there was nothing to be seen in comparison to the work of Ruckwardt, in Berlin, Schmitz, in Cologne, or Van Delden, in Breslau.

Colorsensitive processes are not so much cultivated in France as in Germany. Only two exhibitors could be found with parallel views—that is, views of the same object with color-sensitive and ordinary plates side by side—namely, Attout Tailfer, in Paris, and Boissonnas, in Geneva; while, at the Berlin exhibitions, there were more than a dozen. Boissonnas still works landscapes upon ordinary eosin plates, with yellow glass, superseded long ago in Germany by eosin silver. Tailfer's pictures by gaslight, without yellow glass, were made better in Germany three years ago. His parallel views of spectra with ordinary and eosin plates give for the latter a yellow sensitiveness, which at most is twice as great as the blue sensitiveness, while ten times the yellow sensitiveness has already been obtained with eosin silver plates.

With regard to spectrum photography, the French division is very weakly represented, while the Berlin exhibition could show quite a goodly number of participants. I mention only Kaiser, Eugen von Gothard, Pickering, etc.

Rowland, with his large spectrum, was also represented in Paris in the American division.

In other respects the scientific division of the Paris Exhibition did not offer, by far, so much with regard to photography as at Berlin. Henry, it is true, was represented by six star-charts, but his planet-photographs were missing. Janssen exhibited six pictures of the sun's surface, showing excellently the original "grain structure." There were also some portraits of delirious and hypnotised subjects at the Salpêtrière. Of the interesting nebulae pictures of Common, Pickering and Gothard, of the wonderful star spectra of the second, his moon pictures, the aurora borealis views, Cohn's eye photographs, Tschirch's botanic views, solar eclipse pictures we had in Berlin, there was nothing to be seen at the Paris Exhibition.

Greater recognition can be paid to the balloon views. Here the French War Department exhibited four well enlarged views from a height of 1,000 metres, taken obliquely downward; and Nadar, Jr., had also succeeded in accomplishing something quite respectable in this line. Still they did not surpass the pictures of Freiherrn von Hagen, which, unfortunately, were not exhibited at Berlin. It must be acknowledged that Nadar showed a greater variety in his exhibit than any one else. Besides the usual elegant portraits in all possible shapes to life size, he excelled in some magnificent transparencies. He had constructed in his pavilion a particular window, in which, by means of some mechanism (the same as in a stereo-changing apparatus), different tableaux could be inserted following each other, which contained pretty transparent portraits, and others which were not transparent. A new frame appeared every five minutes. Nadar is the agent of the Eastman Company, and exhibits their apparatus and papers in the most extensive manner.

Other French portrait photographers have also become photo manufacturers, *i.e.*, dealers—Lumière, in Lyons, and Frank de Villecholes, both of whom now manufacture dry plates. Platinum pictures are not so well represented at the Paris Exhibition. Boge (successor of Van Bosch) excelled here mostly. He was also the only one who exhibited photographs produced with artificial light.

Panoramic pictures, which were missing entirely at the Berlin Exhibition, were represented in Paris by two exhibitors, Neurden and Moessard. The former showed in his architectural views the well known curved lines in a more than striking manner.

Marey cannot compare with Anschütz in instantaneous pictures. Besides Marey's there were several quite handsome amateur instantaneous views by N. de Perpignan (surf and marine views, ball players, in $\frac{1}{150}$ second).

The Lichtpans picture was better represented than in Berlin, although the greatest part was made by the Prussian blue process. Aniline prints were entirely missing. Maison Claude, in Paris, and Rochereau furnished also black pictures, which evidently had been treated with alkali, washed and colored with gallic acid. Only one carbon process without transfer was to be seen, apparently similar to the one described in Volkmer's reproduction photography.

Amateur photography was well represented, but could not always be recognized as such. Particularly should be mentioned Rongier, editor of the *Amateur Photographe*, and David, whose specialty is military groups from all countries; also Demarchy. Bazard made some good instantaneous views without a tripod. Particular mention must also be made of the Balagny films, which were

exhibited not only by the inventor, but also by several imitators, in rolls of 4 meters length and to 40 cm. width. They are of great advantage to amateur photography and in the field. Its superiority to Eastman paper, which is not suitable for enlargements on account of its grain, and the complete transparency and lightness are qualities which cannot be too highly esteemed. The films can easily be sent by mail and it is also an advantage that they can be used on either side. Their flexibility has given rise to the construction of a simple panoramic apparatus by Moessard, in which a cylindrical curved Balagny-film serves as a picture surface, and where only the lens is turned, the apparatus being stationary. The samples exhibited deserve consideration. The original Balagny films are made by Lumière in Lyons, apparently not larger than 30 x 25. Lamy furnishes, however, rolls for twenty-four to forty-eight pictures. The longest film is furnished by Grasse & Jongle through Grieshaber, 10 rue de Tresor, Paris.

Another specialty of the French exhibition was the photographs upon wood. Grüne, in Berlin, made these twenty years ago for wood-cuts. At the exhibition they applied these photographs upon wood for decorative purposes and ornamentation.

The exhibition was very abundantly supplied with apparatus, and decided improvements are to be noticed in it. Mahogany has, to a great extent, taken the place of walnut, and English styles are more or less imitated. The Stirn camera is known in France as photo-eclair and has been imitated by Fetter, Paris. The American Detective Camera exists here in many forms and under many names, of which I might mention the "Ideograph" by Martin. The finder is generally separated from the camera and is sold in a separate little case which can be attached to the apparatus.

Particularly new or original constructions I have not been able to discover. With regard to solidity of work the French apparatus does not come up to those of English or German construction.

Of foreign countries the United States were better represented than any other. Germany had no exhibit whatever, and Austria had only two exhibitors. The American division had its place upon a gallery of the first floor. The majority of the pictures were fastened to a screen which was turned towards the skylight, placing the pictures on the shaded side, in a bad position. I would mention here Falk, from New York, with first-rate portraits; Scholten and Guerin, St. Louis, with portraits and genre pictures; Barker, Niagara Falls, with good landscapes, and the New York Amateur Society.

Most effective in the American division were the landscapes of Jackson, Denver, particularly his surprising transparencies, and the gigantic solar spectrum of Rowland, Baltimore. The latter certainly is the highest scientific photographic accomplishment of the whole exhibition.

The absence of Kurtz with his beautiful reproductions and artotypes is to be regretted. He could have easily placed in the shade a number of similar works in the French division. England was not sufficiently represented. The most prominent were Wallery and Van der Weyde, who tried to surpass their French neighbors. Byrne, of Richmond, and Sutcliffe, of Whitby, deserve also honorable mention.

BERLIN, October, 1889.

WHEN a vessel hugs the shore what follows? A little smack on the beach.

NOTES ON ECLIPSE PHOTOGRAPHY.

BY ROYMN HITCHCOCK.

[THE following article was written nearly two years ago, but it may still possess some interest, since, in the absence of important results, the author made no official report of the photographic work of the expedition to Japan in 1887.]

The few words I have to offer upon this subject are doubtless of far less value than I might make them, had it ever been my good fortune to have seen an eclipse of the sun. Nevertheless, a good six weeks of steady and hard work at Shirakawa, Japan, in Professor D. P. Todd's party, has afforded me an opportunity to make a few observations that seem worthy of notice. I went into the work quite unexpectedly, and absolutely unprepared to carry on some investigations that have long been under consideration.

Up to the day of the eclipse the prospects were favorable for clear weather; but as the important moment drew near, hopes began to sink, nothing was seen of totality, and only two or three dim glimpses through the clouds of the other phases.

Consequently I cannot say much about what was done, but must confine myself mainly to what might have been done, or rather to a consideration of what may, and doubtless will be done, on the occasion of the next eclipse, in California. I should say here that the photographic work of the expedition was placed in my charge; and I wish to express my indebtedness to my principal assistant, Mr. K. Ogawa, a Japanese gentleman from Tokio, a careful, intelligent and efficient photographer, who took great interest in the work.

The possibility of photographing the corona without an eclipse depends upon the relative intensity of the light of the corona, and the light of the same kind from the earth's atmosphere. The photographic plate must be made sensitive to the particular light of the corona, and if, in so doing, we can also sufficiently reduce its sensitiveness to other rays, we have a reasonable prospect of success in this undertaking. But the question arises as to the actinic effect of any particular ray of the corona light—1474 for example—as compared with the effect of the same ray in the atmospheric glare. It is no longer a question of coronal light compared with atmospheric light, for the selective action of specially prepared plates now enables us to deal with only a small portion of the latter.

Unfortunately, we know almost nothing as yet concerning the absolute actinic action of the coronal light.* Some of Professor W. H. Pickering's apparatus at Shirakawa might under favorable conditions, have led to some information on the subject, but I hardly know just how much was expected of it. As regards the small "holders for actinic effect," in which small squares of a 4 x 5 plate were to have been successively exposed for a definite number of seconds during totality, by drawing the slide of an ordinary holder, it seems to me that no useful object can be attained by such a device. Under such circumstances

* I am aware that numerous estimates of the intensity of the light have been made, but I do not know of a single one that has more than tentative value. The problem has not yet been properly approached. It is true we do know approximately the length of exposure required to get a photograph of the corona during an eclipse, but that does not enable us to compare the coronal light with skylight, because the active rays from the corona are certainly not the same as those from the sky. The visible effect upon the plate may be the same, because of the general sensitiveness of ordinary plates through blue-green, blue, violet and beyond. Moreover, comparisons of the photographic effect of coronal light with the light of a standard candle, arc, for the same reason unsatisfactory. Obviously the effect of a powerful green light may be equal to that of a fainter violet or blue, acting for the same length of time.

the light from all parts of the sky affects the plate, and the action attributable to the corona cannot be determined.

That this is a consideration of some consequence will be readily admitted when we regard the reflecting action of clouds, or minute particles in the upper atmosphere. It is clearly demonstrated by a photograph taken by Mrs. Hitchcock during the total eclipse at Shirakawa, which shows that the light from the clouds towards which the camera was pointed was sufficient to strongly affect the sensitive plate. My own impression at the time was that there was a great deal more general light over the landscape during totality than we would have had with a clear atmosphere. The clouds were evidently and necessarily the secondary source of all the light that reached us, the corona being entirely concealed, but at no time was it too dark to see the hands of a watch.

Recognizing the importance of a better knowledge of the photographic effect of the coronal light, an apparatus was devised at Shirakawa, by myself, which it was thought might lead to results capable of numerical expression. It consisted of a wooden box fitted to receive an 8 x 10 plate holder at the back, and divided longitudinally by partitions, making twelve rectangular, tubular openings, about 8 inches deep, extending from the plate-holder to within 3 or 4 inches of the upper end of the box. The upper ends of these openings were covered with opaque paper, and apertures of various sizes were cut in this to admit the light. The box was then pointed to the sun's place, and Lieutenant W. H. Southerland, U. S. N., kindly took charge of it. The plan was to expose a plate in the box to the coronal light for a known number of seconds, and subsequently to expose another plate of the same kind to a standard light, and thus get a comparison. Comparisons of this kind, however, only become of great value when they are made with lights of the same character and with plates that will respond only to the special radiations to be investigated.

Recurring now to the matter of plates for photographing the corona without an eclipse, I would first make a short quotation from an article on "Astronomical Photography," that was written by me during the fall of 1886 :

"The attempts that have recently been made to photograph the sun's corona without an eclipse, with the so-called 'coronograph,' have not been successful. The explanation given is that the light from the corona is too faint to impress a plate in the very luminous atmosphere around it. Nevertheless, Dr. Schuster, using paper prepared with a slow emulsion by Captain Abney, succeeded in getting two good and two fair photographs of the corona.* Mr. Huggins, therefore, may still be confident of success, if the proper kind of plates be used. I am not prepared to state just how such plates are to be made, for that must be a matter of experiment. But we have to consider that the general glare around the sun is a strongly actinic light, such as comes from a well-lighted sky, while the coronal light is especially strong in particular rays, which must be singled out by the sensitive plate.

"The promises of this method of investigation are certainly alluring, and I regret not to have the opportunity to conduct the experiments. There is no obvious reason why we should not be able to photograph every day, by the method of Mr Huggins, on suitably prepared plates, not only the corona but also the chromosphere in connection with it, although, possibly, to secure a

* When this was written I did not know the nature of the plates referred to.

good representation of the latter it would perhaps be necessary to use colored glass instead of the opaque disc."

From spectroscopic observations it would seem that the distinctively coronal light is that of the line 1474 K, and it was with this idea that I proposed at Shirakawa to attempt to photograph the corona with plates specially sensitive to green light. No such plates were prepared, for the reason that it was impossible to obtain the necessary materials for making them; but it was proposed to reduce the action of the blue and violet light by coating an ordinary plate with plain collodion colored with chlorophyll,* and a solution for that purpose was prepared from green tea leaves.

The experiment was not carried out owing to the cloudy weather, and no subsequent experiments to test the practicability of the plan have been made because other methods are certainly better.

As regards the coronal light, it is a matter of indifference whether the green or the violet light is photographically the stronger, for the green is certainly the most characteristic ray†, and our efforts should be directed to preparing plates that will single out that ray and cause it to impress the image of the corona upon the plate.

It was only after my return to my home in Osaka, on October 10, 1887, that I learned that Dr. Schuster had already used plates sensitized for green light in his recent work. This I discovered while looking over back numbers of "Nature." On page 547 of "Nature," April 7, 1887, Dr. Schuster reports as follows: "The film was one prepared by Captain Abney, so as to be more sensitive in the green than ordinary plates. The photograph obtained is faint, but I believe will ultimately give good results." Although I cannot, therefore, claim priority in this matter, it is proper to uphold originality in such a promising field of investigation.

After the eclipse I spent a few days waiting for satisfactory weather to photograph the corona with the heliostat. For this purpose I obtained the straight bodies of three Japanese paper lanterns, and had them joined end to end, thus making a tube about 4 feet in length. This was straightened and stiffened with strips of bamboo, lined with black paper, and three or four paper diaphragms fixed inside. It was then mounted on the heliostat mirror, and pointed to the sun. It will be seen that this paper tube corresponded with the tube of diaphragms used by Mr. Higgins with his reflector. After this was ready we had not a day of clear sunshine before it became necessary to pack the apparatus. I would say, however, that I now consider the tube of diaphragms to be a valuable

* I was not then acquainted with Captain Abney's experiments showing a special sensitizing action of coloring matters applied in this manner. I regarded the colored film as an absorbing medium, although I hoped it might also act as a sensitizer.

† I am not now quite so sure that this green ray is the most characteristic of the corona. But if it is always present and belongs to the corona, I should still regard it as preferable to any more refrangible ray for coronal photography. The violet ray, for example, lies in the midst of a very long extent of spectrum, which acts strongly on a sensitive plate. Hence it must be very strong as compared with the blue and violet of the atmospheric glare, if we are to get strong photographic contrast. The green line, however, lies just about where the spectrum photographs the weakest on most color-sensitive plates. No doubt plates could be made specially sensitive to that color, and it is obvious that a colored screen could be used to cut off the light from the blue upward, leaving the green almost undiminished in strength. To accomplish the same result in the violet would require a light filter which would be almost as selective in its action as a truly monochromatic medium for the coronal ray.

I have, indeed, thought of applying a prism to isolate the particular rays for the camera, very much as in eye-observations of the chromosphere, but with more moderate dispersion. I have no doubt, that if there are no serious mechanical difficulties to interfere, a reflecting prism set at the angle of total reflection for the coronal rays could be advantageously applied to isolate these particular rays and throw them into the camera.

addition to the heliostat. Professor Todd pinned his faith upon a light-tight tube with diaphragms extending from the objective to the photograph house, expecting thereby to get clear pictures. It was found that we did, in that way, get clear pictures with a bright sun, but on the day of the eclipse the conditions were different, and the pictures were not so clear. The reason is not far to seek. Where the sun is bright very quick exposures can be made, and the skylight is so weak relatively to the direct sunlight, that it cannot affect the plate around the sun's image. On the other hand, when the sky is overcast, the cloud-light is strong and the sunlight is less bright. The slit has to be opened very wide and the exposure must be longer. The mirror throws in a flood of strong cloud-light, which affects the whole surface of the plate. That this is a true explanation of the facts observed must be evident to any one who will look at the mirror from the photograph house, when working on a cloudy day.

In concluding this part of the subject I would only state my unbroken confidence in Mr. Huggins' method of photographing the corona without an eclipse, but good results can only be obtained by using special plates. The conditions of success require :

1. A tube with diaphragms to reduce sky-light.
2. Plates sensitized for green light.
3. A clear sky.

The use of the heliostat in photographing the phases of a solar eclipse necessitated the adoption of certain devices not hitherto employed. Among the most important was an arrangement for photographing the plumb-line during the time when the cusps are so small that it would be impossible to center them on the wire. After experimenting one or two evenings in various ways I found that the direct light of a small kerosene lamp would serve as the most available source of light. A cylindrical tin lantern was then made to fit over a common hand-lamp, and two tin tubes, of about half-an-inch in section, were attached to the side, one pointing obliquely upward and the other obliquely downward, at such an angle that, with the flame at the apex, two spots of light would be thrown upon the sensitive plate, one at the top the other at the bottom, quite outside of the position of the cusps. This lantern was mounted on a counter-poised shelf, sliding up and down between two uprights in front of the plate and about six inches from it. It was found that about four or five seconds exposure would suffice for the plumb-line with this apparatus, and when using it we could readily take a picture of the sun every fifteen seconds. The movements of the heliostat mirror were placed entirely under control from within the photograph house by a very ingenious contrivance of Mr. John Pemberton, C.E., Passed Assistant Eng. U. S. N., and the position of the sun's image could be adjusted at any time by means of a reflector in the side of the long tube, as suggested and arranged by myself, which gave a clear view of the black spot on the outside of the exposing slide through a small aperture in the wall of the photograph house.

Although not directly connected with the subject of this communication, I would like to refer to another application of the box, already described for measuring the effect of the coronal light. It was my intention to accompany Professor Todd in his trip to Fuji Mountain, and for that purpose a second box was made, precisely like the first. It was intended to place one of them below, carry the other up the mountain and to make simultaneous and equal exposures

with the two. In this way it was thought the photographic effects of the light at the two stations might be satisfactorily compared.

The intention was to have the boxes pointed to the same part of the sky, and to make the exposures when the air seemed to be quite clear at both stations. I do not attach very much importance to the results of such comparisons, but they would certainly possess some interest.

OSAKA, JAPAN, October 26, 1887.

A NEW PLATINUM TONING PROCESS.

BY LYONEL CLARK.

[Before the Camera Club.]

THE very great stability of the metal platinum, superior even to that of gold, has from the very commencement of photography naturally excited many workers to experiments, with the view of making it a basis for a positive printing process that was to defy the ravages of time. As far back as 1832 we find recorded experiments of Sir John Herschel on the action of light on the salts of this metal; he was soon followed by Robert Hunt, amongst others, who has left a very detailed account of his numerous experiments in the pages of his well-known works on "Light" and "Photography." In more recent times Willis entered the field, and his experiments resulted in the well known hot and cold bath platinum process, which will hand his name down to posterity as the father of all platinum printing. Of the numerous array of smaller workers I will not weary you; their efforts are to be found here and there in the earlier numbers of our own and foreign photographic journals.

But I cannot continue without devoting a few words to the experiments of Mr. Burnett, of Edinburgh. This gentleman appears to have tried every salt of platinum as toning agents, and moreover appears to have specially advised the use of the platinous in preference to the platonic salts, and also advises their use as developers of images formed on uranic or ferric papers, thus closely foreshadowing the present platinum processes.

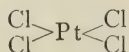
A careful study of all these experimenters' works shows, however, that the platinum salts are not practically reducible by the action of light, even when in the presence of organic substances, but if it be wished to obtain an image in platinum black, it is first necessary to form a provisional image, visible or not, and then, by means of a toning or substitution process, convert this provisional image into one formed of platinum.

Every kind of platinum printing at present known is subject to this law, which distinctly separates it from the ordinary types of positive printing in silver, whether direct or by development. In these processes the image is formed of silver which has been blackened by exposure to light, or rendered prone to reduction by suitable agents, and this blackening forms the image. In platinotype the image is formed of another metal, to be replaced later on by platinum, and by a substitution process analogous to that in which the silver image is sometimes partly replaced by the gold of the toning bath. Gold-toning is sometimes described as a gilding process, and it is assumed that the silver image is coated, or gilt with a thin layer of gold, but I think there can be no doubt but that it is a pure chemical substitution process, three atoms of the silver image being replaced by two of gold, the silver chloride, or oxychloride, that is so formed being subsequently dissolved out in the hypo.

The well-known modern platinotype processes of Willis and Pizzighelli come under the above rule as toning processes, the only difference being that the metal of the provisional image is iron instead of silver, and at present all known platinotype processes may be classed together under the head toning processes.

The first gentleman who appears to have practically used platinum as a toning agent was a Frenchman named M. Carranza, who described his process in *La Lumière*, February, 1856, and *Photographic News*, vol. i, p. 251. He used a

dilute solution of platinum chloride acidulated. Now, the commercial chloride of platinum is, according to Pizzighelli, chloro-platinic acid; the real platinic chloride is PtCl_4 , but is insoluble in water, and therefore hydrochloric acid is added, making the formula $\text{PtCl}_4 \cdot 2 \text{HCl}$; it further contains $6\text{H}_2\text{O}$. Now, in this salt, which is the common platinic chloride of commerce, sometimes called bichloride, a relict of the older chemistry, the platinum is tetravalent, that is to say, its molecule is formed of an atom of platinum united to four atoms of chlorine,

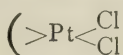


and therefore when a substitution is effected, four molecules of a univalent salt (that is a salt which is satisfied by a single atom) must be brought up to the platinum salt, and each take one atom of chlorine before the platinum can be reduced to the metallic state. Silver is such a metal, and if the atomic weights of this salt and platinum were the same, it would mean that four parts of metallic silver must be converted into the chloride before one part of platinum metal could be formed, and therefore the deposit would only be one-fourth as thick. Or again, if their colouring properties were equal, after the substitution, the intensity of the platinum image would only be one-fourth that of the provisional silver image. However, platinum has, weight for weight, like gold, a greater coloring property than silver; and furthermore, the substitution process is never very thoroughly carried out, but still there is a very decided loss of intensity in a print which has been thoroughly toned by platinic chloride. It is extremely probable that the free hydrochloric acid has also a deleterious effect on the image; for in the best toning formulas, which contain platinic chloride, it is recommended to first neutralise the hydrochloric acid and then re-acidify the solution, preferably with nitric acid. But even after this precaution, it cannot be said that there is any satisfactory process of toning by platinic chloride at present described.

In comparing toning processes by means of platinum with those where gold is used, it must also be remembered that the platinum is much less easily reducible than gold, and Mr. Willis found, in his early experiments, that the salt was by no means to be precipitated like the chlorides of gold or silver. However, the fact that oxalic acid greatly aided the reduction of gold from its salts, had long been a known fact in chemistry, and its similar action on the platinic salts had also been noticed by Döbereiner (Schwergger's "Year Book," vol. xvii, p. 122), who found that chloride of platinum in solution of sodium tartrate or oxalic acid separated out under the action of light in the form of a thin film. This fact appears to have also been known to Willis, who in his early experiments found that a hot solution of oxalate of potash instantly precipitated the platinum from the chloride when in the presence of a protosalt of the heavy metals, in his case ferrous oxalate being the one used.

But, as we have already seen, the platinic chloride demands that four molecules of ferrous oxalate shall be converted in order to liberate one molecule of platinum, and since the ferrous oxalate has to be formed by the agency of light, it follows that the proof must be very much over-printed in order to get enough of the ferrous salt to make the image of sufficient intensity.

It was at this point that Willis introduced his great improvement, which made platinotype a practical process. He found that platinum was capable of forming a second series of chlorides, in which the metal acted as if it were divalent. Such a chloride is known as platinous chloride, PtCl_2 —, in which we may suppose that where two of the bonds of the platinum atom are satisfied, each with a chlorine atom, the other two mutually satisfy each other.



It is evident at first sight that with this salt it will only require that two molecules of any univalent metal be presented to the platinum salt, when they will take up the only two chlorine atoms in it; and liberate the metal, and

therefore with this salt we only require half as much reduction to produce an equal effect as it would were the platonic chloride used. We may further assume that the two bonds that are satisfied by each other are in an unstabled equilibrium, and can easily be dissociated, and thus accelerate the rupture of the complete molecule, and render the ultimate precipitation of the metal more speedy. I think that there can be no doubt that experiment and practice has proved the correctness of the above theories, and I hold that platinum toning only became a practical possibility from the day that Willis employed the platinum instead of the platonic salt.

Platinous chloride itself is an insoluble salt, but it forms with the halogens double chlorides, which are freely soluble in water; the salt that has proved the most suitable being the double chloride of potassium and platinum, known as the chloroplatinite of potassium, 2KCl.PtCl_2 , or K_2PtCl_4 .

In the most recent of the platinotype processes, known commonly as the cold-bath process, or Willistype, this salt is practically used, the provisional image being formed of ferrous oxalate, in which, however, the organic matter in the sizing of the paper certainly has some action; this provisional image is converted into platinum by the addition of the chloroplatinite of potassium, oxalate of potassium, and monopotassic orthophosphate, the quantities being as follows:

D	
Oxalate of potash.....	5 ounces.
Monopotassic orthophosphate.....	3 "
Water.....	50 "
P	
Platinum chloroplatinite.....	60 grains.
Water.....	2 ounces.

Normal developer, D 3 parts + P 1 part + water 2 parts.

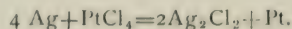
This developer is brushed over the print, or the print is floated on the developer; the faint lilac image very rapidly changes to a deep rich black, the print being completed in from one-half to one minute. The unaltered iron salt has then simply to be dissolved by suitable acids, and the proof is complete.

When we come to the other sort of platinum-toning, where silver is used as the basis, we see that very much the same chemical changes obtain. The coloring matter of which the image is formed is more complex in its nature, being probably a mixture of metallic silver, purple subchloride, and a deoxydised organate of silver, which Messrs. Davanne & Girard very appropriately term a lake.

It is, therefore, difficult to say precisely whether any particular one, or all of these compounds, have an action. I am inclined to believe that the violet subchloride practically plays no part in the transformation; for if the print be treated with common salt, all the violet subchloride is destroyed and the reddish organate of silver alone remains, but yet the toning goes on as well (perhaps a little more slowly) as usual. But at the same time, if a print be fixed in hypo before toning, as far as my present experience goes, I find that the print refuses to tone; with plain paper prints, however, there is a slight tendency to tone.

There is a certain contradiction in this which I cannot as yet solve or explain.

But whatever may be the precise composition of the salt that forms the provisional image, the action is precisely the same as in the case of iron. Assuming it to be metallic silver, we should get the following equation, parodying that of Berkeley :



this is, of course, far from being correct; for we know that the silver is not wholly in the metallic state. However, the equation shows clearly enough that four molecules of the silver are converted into chloride before one of platinum is reduced, and these four molecules of silver had to be produced by the action of light.

With plain paper-prints, that is, paper simply salted and excited, it is an easy matter to obtain some sort of toning with any platinum salt, but not so with album-

inized prints ; this fact was noticed from the very first by Haackmann (*Photographic News*, vol. i, p. 251). It would appear, therefore, that the reduced albuminate of silver that is formed by light has a mechanical action that tends to prevent a ready interchange between the two metals, and that we should therefore endeavor to soften the albumen by some agent, such as tartaric, acetic, or tribasicphosphoric acid added to the toning-bath. I have, however, such a dislike to the surface gloss of all albuminized prints, that I do not take enough interest in them to experiment in this direction.

I have, however, for sometime past been trying to bring about a thorough toning of matt-surface silver prints by means of platinum. The goal I have aimed at is to have a print that can be examined in the printing-frame as it progresses ; the advantage of this for combination or cloud-printing is obvious. Secondly, the greater part, preferably, the whole of the silver, should be replaced by platinum black—that is, that the print should not change color when treated with mercuric, cupric, or other chlorides or oxydizing agents. Minor points are that the prints should not lose in intensity in the toning, that the color should be variable, that some power of altering the gradation or scale of tones should be possible, by slightly varying the toning ingredients ; in short, that the process should be as perfect and as well under control as the cold-bath platinotype process, with the advantage that the paper requires no special precaution in keeping, and the image is plainly visible. So much for Utopia ; now for practice.

My first experiments were naturally made with the ordinary commercial platonic chloride, and I found that it certainly was capable of toning, although slowly, and as the formula shows there should be, I got a great reduction of half tone, and general loss of intensity over the whole print. Following the lines of Willis, I tried the addition of oxalate of potassium ; this certainly improved the toning of the platinum, and it was possible to completely convert the image into an agreeable tone, but the loss of intensity was very great, and the prints, to have any vigor at all, had to be printed very deeply. The effect of this was to cause granulation in the darkest shadows, that is where the print was solarized and had the well-known metallic lustre due to this cause. In this the silver prints show a striking analogy to the iron ones ; it is a well-known fact, both in the hot and cold bath platinotype processes, that after a certain exposure the image solarizes, and becomes lighter in color than the surrounding parts. I have repeatedly noticed that these solarized parts on development also gave granularity. I cannot chemically account for this ; I can only presume that in these solarized parts the metal has been completely reduced from the organate, and that it has a tendency to form into nuclei around which the deposit of platinum is more violent.

Finding, then, that the ordinary platonic chloride was unsuitable for toning, it was only natural at this stage to further follow Willis' example and use the platinous salt. This I did, and my first experiments were made with the ordinary developer as recommended by Willis in his cold-bath platinotype process. My very first trial gave me a very remarkable success, so much so that this developer is a very good toning formula in itself without any alteration. In my first experiments I proceeded exactly according to Mr. Willis' instructions. I of course washed the plain paper prints to free it from the free nitrate, and then simply floated it over a little of the developing solution spread out over a piece of glass ; the toning took place with the greatest of rapidity—in fact, quite as quickly as the ferric oxalate paper, the red-brick color of the silver organate rapidly giving way to the black of the platinum. When this color, viewed by transmitted light, had entirely disappeared, the print was fixed and washed in the ordinary way, and an image was left, resembling very closely an ordinary platinotype hot-bath print in color. I described this process, and showed some specimens at the meeting of the Camera Club, November 29, 1888, when Mr. Willis gave his demonstration of his then new cold-bath process.

During the winter I allowed my experiments to lapse, but in the spring, incited thereto by the appearance of Mr. Valentine Blanchard's toning process, which possessed considerable analogies, I continued my experiments.

With the ordinary platinotype paper the chloroplatinite of potassium is not reduced when applied to the paper in an aqueous solution, but requires the addition of a soluble phosphate or oxalate; but with the silver provisional image such is not the case, the platinum being rapidly reduced from the chloropotassic salt without any further addition. It is difficult to say precisely whether any advantage accrues from the addition of the oxalate; when present in large quantities it is injurious, giving a brown or yellowish color to the delicate half-tones, and when present in small quantities it appears to have no very appreciable effect, so that in my subsequent experiments I have entirely discarded all other chemicals but the chloro-platinite of potassium. At the same time I am inclined to think that the oxalate may cause a more complete reduction of metallic platinum and so tend to permanency. Further experiments are wanted in this direction.

The next series of experiments were made to determine the solubility of, or the best amount of water to use with, the chloroplatinite of potassium. It must be confessed that but very little difference is to be found in the resulting prints from any variation in the strength of the developing solution. By difference is meant, of course, a variation in the scale of gradations, or intensity curve of the print. The sole difference between using a concentrated solution 1 in 15 (platinotype formula) and 2 grains to the ounce (1 in 218), is that the former completes its work much more rapidly—in fact the change is almost instantaneous, and the print may be held in the hand and watched during the operation. In such a case it is, of course, preferable to either brush the solution over the print or else float the print on it. When more dilute solutions are used the toning proceeds more slowly, and the print should be immersed in a bath as in ordinary gold toning. The results, however, will be sensibly the same, with the advantage in favor of the stronger solution, which has a tendency to give slightly more brilliant results. The strength that I practically use now is about 1 in 218—that is, a drachm of the platinotype solution is made up to 2 ounces, with which the toning proceeds quite rapidly enough to enable the developer to be brushed on. I will refer later on to the practical details of the process.

The alkalinity or acidity of the bath demanded also a series of experiments. I do not find any appreciable difference with results when the solution is acidified. The prints have perhaps a slightly blacker appearance, but that is all; but when rendered alkaline, the solution refuses to tone at all, even when a concentrated solution (1 in 15) is employed. This fact is very noticeable; so powerful was the toning solution, that when the wet print was immersed in an acid solution to neutralize the alkali, there was enough platinum left in the pores of the paper to instantly tone the print. Even when only a little alkali is present, I find the toning action is much slowed. In this respect my results differ from those of Gwentian, (*Photographic News*, vol. ii, p. 263), who says, alkaline solution gives brown and acid ones blue tones.

With regard to the formation of the provisional image, all my early experiments were made on ordinary commercial mat-surface sensitized paper. I have used several brands, some obtained from the Civil Service Stores, some from Marions, Watson's, and Valentine Blanchard. The last two papers gave decidedly superior results, owing, probably, to their being more richly silvered. It is necessary in this process, if an ordinary negative is to be used, that the paper be somewhat rich in silver, as a good deal of this metal must be reduced in order to obtain a very dense deposit of platinum; in fact, with the same negative, it is not possible to obtain as deep a black on any brand of ready-prepared paper as can be obtained with the ferric oxalate paper of the Platinotype Company. A sufficient intensity for all ordinary purposes can be obtained, however, from any fairly plucky negative. The prints I show, together with the negatives, will give you an idea of the results that can be obtained from the ordinary material, to be obtained from the chemist.

But I think it is one of the great advantages of this process that it is an extremely easy matter to sensitise one's own paper. It will at once be evident the artistic power this gives one; not alone are we confined to rough or hot-pressed

parchment or plate paper, but we can produce our pictures on silk or cotton, leather or satin jean, or whatever material the texture of which we think may enhance the effect we have in view. The few examples I hand around, hurriedly and imperfectly executed, will, I hope, give you an idea of the power it puts in your hands.

Although foreign to my paper, I will here give you the salting and sensitising mixtures that I have found most suitable for the formation of the provisional image :

SALTING SOLUTION.

Gelatine	90 grains.
Chloride of ammonium	60 “
Carbonate of soda (re-crystallized)	120 “
Citric acid (in crystals)	30 “
Water (rain or distilled)	10 fluid ounces.

Any gelatine will do. The ordinary gelatine of the housekeeper, sold by Nelson in 1 ounce packets, answers very well. The above quantity will be sufficient to make the above solution set into a weak jelly when cold. More or less can be added, according to the taste of the operator, or the amount of size the paper already contains. In the place of gelatine, starch or arrowroot may be used (for English animal-sized papers I prefer arrowroot) the resulting tone of the print varying slightly thereby. The quantity of the sizing must, of course, vary with the quality of the paper used. The object of the sizing is to keep the image on the surface ; therefore, with a porous paper much, whilst with a glazed paper little, should be used. The above amount will be found sufficient for most papers without causing any objectionable gloss after finishing.

I prefer the ammonium to the other chlorides myself, but sodium or barium can equally well be used, the proportions then being, for the above formula, sodium chloride, 72, or barium chloride, 138 grains. The paper should be floated on this mixture, or it should be brushed over it, care being taken not to wet the back. It should then be hung up and allowed to dry. In this state it may be freely exposed to light.

With regard to the sensitising solution, I much prefer the variation in the ammonio-nitrate of silver as introduced by Hardwick, the strength I use being 60 grains to the ounce. The following is the method of preparation : Dissolve the 60 grains of silver nitrate in $\frac{1}{2}$ ounce of water ; then add strong ammonia till the brown precipitate first formed is re-dissolved ; then divide this mixture into two parts, and add nitric acid till it gives a distinctly acid reaction ; then mix the two parts together, and make up to one ounce. This solution is ready for use at once, and only keeps in the dark.

This solution of silver oxide, dissolved in nitrate of ammonia, is undoubtedly the most rapid process ; but, like other processes, when speed is desired, its manipulation is more difficult, and it does not keep. In this respect it is vastly superior, however, to the ordinary ammonia-nitrate process, which hardly keeps a few hours. Paper prepared with the above formula will, I find, keep a day, or even two, with care. A great disadvantage is that it is impossible to float the paper on this mixture, but it has to be brushed over the surface of the paper, or applied with a glass rod, in the usual manner.

Therefore I largely use the ordinary nitrate of silver process, using a bath of the same strength—60 grains to the ounce. This bath can be used over and over again, and sheet after sheet floated till it is all but exhausted. With this bath, however, I prefer to slightly increase the amount of salt, making it, say, 90 grains. I find a paper so prepared to be fairly rapid, giving untuned prints of a rich color. I find also that it is advisable to add citric acid to the above solution till all effervescence ceases, and the reaction is slightly acid. This is unnecessary if the paper be fumed, a process which, in very dry or very dull weather, I can most confidently recommend. For further details as to plain paper silver printing I would refer you to the pages of Hardwick's *Photo Chemistry* and *British Journal of Photography*, leading article, 1878, page 78 and *ante*, where full practical details are given.

I will assume, therefore, that paper has either been bought or sensitized at home, and the proof is in the printing frame. It is, of course, evident that the progress of the print can be watched in the usual manner, but the extent to which printing is to be carried on to compensate for loss in the subsequent substitution process demands a few words.

There is but one slight loss from this cause in this process. Some diminution of tone is, of course, observable, but in giving working directions, I should say that the loss is about the same as that in gold toning, and I print therefore till the high lights just show signs of degradation. However, in the demonstration with which I will conclude this paper, you will be able to see for yourselves the actual loss of detail. It must also be remembered that plain paper prints always lose in intensity proportionally more than albumenized prints. This loss takes place in the preliminary washing to remove the free nitrate. It therefore follows that these papers should be printed somewhat deeper than albumenized ones.

On removal from the printing frame the print should be well washed in several changes of water, till all the milkiness disappears. The presence of these free silver salts do not in any way injure the subsequent toning processes, but they render the toning solution, which is used in a somewhat concentrated state, somewhat dirty and cloudy. I therefore prefer to wash thoroughly.

The toning solution is made up as follows :

Stock solution A chloro-platinite of potassium.....	60 grains.
Distilled water.....	2 fluid ounces.

This is the ordinary solution as given by the Platinotype Company :

Take of A.....	1 dram.
Nitric acid.....	2 or 3 drops.
Water up to.....	2 fluid ounces.

I prefer to add HNO_3 to the solution to ensure its being in an acid condition, the least trace of alkalinity being sufficient to considerably retard the action, but with many papers it is unnecessary.

For those workers who do not use the platinotype formula, I would point out that the above solution means 2 grains to the ounce of water, and, therefore, the 60-grain tube can be at once made up to 30 ounces, and duly acidified.

If the weather is cold, I prefer to warm the solution, say, up to 80 degrees Fahr. ; this has always an accelerating effect, but too much heat should not be applied to a strong solution, or it will eat away the half tones.

The prints can either be immersed in this solution, or if only a few are to be done, can be floated on a small quantity of the solution poured over a levelled plate-glass dish. With the above strength, the toning process takes place very rapidly, in from two to five minutes, according to the tone it is wished to obtain. If stopped at an early stage, the prints have a brown color, whilst if carried on till all redness, as viewed by transmitted light, disappears, they become of the well-known platinum black. If several prints are to be toned at once, it is perhaps best to still further dilute the toning solution, or its action will not be under proper control. In fact, in all cases where it is wished to obtain warm tones, and to have the action well under control, I should advise a considerable weakening of the developer, and to make it up as follows :

Stock solution A.....	1 dram.
Nitric acid.....	2 or 3 drops.
Water.....	up to 8 fluid ounces.

Several prints can then be immersed in the above bath, and turned over and watched as the toning proceeds.

After removal from the toning bath, the prints should be placed in a basin of water rendered alkaline by carbonate of soda or ammonia ; this is to neutralize the free acid of the toning bath, which, if carried over into the hyposulphite, would cause a precipitate of sulphur, and a probable yellowing of the high lights of the print. Where only a few prints are being manipulated, the hyposulphite

bath itself can of course be rendered alkaline. In the fixing bath, if the toning has been complete, the prints should not change color, and lose nothing in intensity; but if the toning has been stopped at the reddish purple stage, they will change to a brownish black, this color depending, however, somewhat on the process by which the print has been prepared. This change of color is due to the silver salts that are left in the paper being altered in color by the action of the hyposulphite of soda. When, therefore, it is desired to match any given tone, it is advisable to treat the prints before toning with a weak solution of salt in water. The action of this is to dissolve out all the purple sub-chloride, and leave only the red or brown sub-organate of silver. As I have mentioned in the early part of my paper, this has no action on the toning action, if we except a very slight general reduction of intensity.

The several prints handed round to you have been prepared with the idea of showing some few of the different tones that can be obtained by different salting and sensitizing mixtures, in connection with different materials. They are on silk, nainsook, satin jean, Whatman's rough surface drawing papers, Creswick paper of 1865, having slightly a yellow tinge; also a thin bank post paper that appears to promise excellent results, and is almost thin enough to permit of its being mounted in printed books, without bulging them too much. Many samples on ordinary commercial barium salted paper are also shown, and some on Watson's mat surface sensitised paper. Generally speaking, I may remark that the English animal-sized papers tone with more difficulty than the starch or resin sized German or French papers. This is probably due to the fact that the decomposed sizing is in an alkaline condition, in which case, a preliminary bath of citric or acetic acids would appear to be advisable.

Before I proceed to my demonstration, I presume I must say a few words as to the permanency of this process. I had hoped to find that the substitution of the platinum was complete, but I am obliged to confess that this is not so. It is possible to replace the silver to a very large extent, but not completely. This is equivalent to saying that the process is not as permanent as the ordinary plainotypes of Willis.

I have here silver prints toned by gold by my own process, and a print by the cold-bath process of Willis. These proofs were torn into strips and subjected to (1) chlorine gas, formed by the addition of hydrochloric acid to bleaching powder (hypochlorite of lime); (2) chromic acid; (3) sulphuretted hydrogen (formed by the addition of sulphuric acid to a soluble sulphide); (4) bichloride of mercury; (5) alum $\text{AlK}(\text{SO}_4)_2$ slightly acidulated with sulphuric acid (to represent the condition of a sour paste containing alum). I must here bear witness to the remarkable stability of the cold-bath platinum prints, which passed through the above ordeals absolutely unchanged. The gold-toned prints (gold chloride and carbonate of soda) were unaffected, or only slightly affected by the mercury, showing that the toning was pretty complete; but the chlorine had entirely eaten off every face of the image, leaving only white paper. The sulphuration at first somewhat darkened, but then yellowed, the color of the deposit. The alum also had a decided lowering of the tone. In the prints prepared by my own process, the mercury had not the slightest effect; the moist chlorine had, however, considerably damaged the image, but still there was a very considerable amount left; the sulphuration and the other tests had very much the same result as on the gold prints, but in a less degree. Some similar prints on plain fixed chloride, and developed bromide of silver papers, were, with the exception of the sulphuration and alum tests, of course absolutely destroyed.

From the above results I deduct, therefore, that prints prepared by my process, although vastly inferior to the ordinary platinotype prints, are yet a good deal more stable than those prepared in a similar manner, but toned with gold and vastly superior to developed bromide papers. Looking at the well-known longevity of such prints, when carefully prepared, this may be assumed to promise them a fairly long life.

Mr. Clark then proceeded to tone some prints that had been previously

printed on some of Watson's matt-surface sensitized paper. The toning dish consisted of an ordinary glass-bottomed dish, provided with three levelling screws. This dish was first levelled by means of an ordinary level, and four ounces of toning solution were poured on it. With this some twenty 12 x 10 and 10 x 8 prints were rapidly and successfully toned.

DISCUSSION.

Mr. LYONEL CLARK, in answer to Mr Edwards, said that the white spots alluded to were due to unequal sizing of the satin jean. This being a somewhat thick material, it was sometimes difficult to size it equally. With regard to the permanency of the prints, he had never pretended that they were as permanent as platinum prints, but still he contended that they were permanent enough for ordinary purposes; as a matter of fact, one did not fill one's rooms or exhibitions with chlorine, or preserve prints in chromic acid; and even supposing that such an accident should happen, all was not yet lost, for it was perfectly possible to restore such prints by the application of any of the ordinary developers. In response to an invitation from Mr Edwards to restore the faded print in his possession, Mr Clark promptly proceeded to successfully do so by means of ferrous oxalate. Resuming his reply, Mr Clark said, in answer to Mr Gifford, that the kind of water used appeared to have no appreciable effect on the toning. He was aware of the difference that existed in the case of alkaline gold toning; the water he had used in his experiments contained so much lime that it was perfectly possible to tone without the addition of any alkali with gold, whereas, with the club water, which he was then using, this was not so. But the difference was not noticeable in the present process. Probably this was due to the free nitric acid he added to the toning baths. With regard to albuminised prints, he must admit that, in spite of his dislike to the gloss, curiosity had compelled him to try the effect, and he found, that although the action was decidedly slower, still albuminised prints could be perfectly well toned by the chloro-platinite. With regard to the gelatino-chloride prints he had not tried, but had no doubt but that it would act. As a rule, the gelatinous prints are more easily toned than the albuminised ones, and he thought that this would hold good in the present case. He somewhat regretted that the present discussion, instead of confining itself to criticising the process before them, had wandered into a certainly most interesting discussion on the cause of granularity in platinum prints, coupled with a learned disquisition on the hygienic properties of the manipulator's skin. He should be most happy to enter into a discussion on the causes of this granularity at the proper time, as he had been experimenting in this direction, and could assure Mr Edwards that in the cold bath process it was not attributable to damp. With regard to Mr Edwards' advice as to using the indiarubber pads, when printing on platinum, he might be allowed to adduce, as an advantage of his process, that no such pads were necessary at all; and although all the prints shown had been printed within the last ten days, the dampness of which Mr Edwards has so eloquently touched on, still he did not think that these prints had suffered therefrom. In conclusion, it was not for him to dilate on the advantages or capabilities of his process. The results were before them, and from these results it must be judged. The means of working it had been given them all completely, and he would only hope that he had made his lecture and demonstration sufficiently interesting to induce some of them to give this process a trial.

THE PHOTO-MECHANICAL PRINTING METHODS AS EMPLOYED IN THE JUBILEE YEAR OF PHOTOGRAPHY.

BY THOMAS BOLAS.

[Before the English Convention.]

LITTLE did the first makers of sun-pictures imagine that, within the short time of fifty years from the time of their work, what one may term solid metal photographs would be running to and fro on the "coffins" of our largest and quickest printing machines, and from them impressions, just in all gradations of tint, would be turned off at the rate of something like fifteen hundred an hour. Such is, however, the case at the present time, and probably there is scarcely a typographic printer in London who has not worked from the photo-tint blocks now so common.

Though phototype blocks represent in the aggregate the form in which photo-mechanical printing surfaces are most commonly met with and used, it is desirable to take a brief survey of the most important printing methods which come under the category of photo-mechanical methods, and we may begin with

PHOTO-LITHOGRAPHY.

In the method which is most common, a sheet of paper coated with gum, albumen, or gelatine, containing bichromate of potash or ammonia, is exposed to light under a clearly defined and intense line negative, and after exposure the sensitive surface is thinly and uniformly coated with printers' ink, or a special ink of analogous composition, but made up with less pigment than is contained in the usual ink. The inked paper being now immersed in water and the surface very gently rubbed with a soft and long-haired camel's-hair brush, the ink becomes removed from the parts where the bichromated colloid has been protected from the light by the opaque parts of the negative. The bichromated colloid, where acted upon by light, loses its power of softening in water and retains the ink; where acted on by light it softens in the water and the ink loses its hold. The image with printers' ink thus prepared is called a photo-lithographic transfer.

The following details are sufficient to enable any photographer to make a transfer in fatty ink ready for the lithographer to "put down" on the stone, and print by the ordinary lithographic method, which method need not be described here, as it is in no way photographic, and no special treatment is required in dealing with a transfer made by photography.

A sheet of plain paper is floated on a warm solution of gelatine (containing 6 per cent. of gelatine), and it is then hung up to dry. When dry it is insensitive to light, and it may be kept any length of time without injury. To make it sensitive to light it is soaked for a few minutes in a solution of potassium bichromate, which contains about $3\frac{1}{2}$ per cent. of the salt, and it is once more hung up to dry, but this time in a dark room, or in a room illuminated by yellow light. When dry, it is ready for exposure under the negative.

For a short time it is now left soaking in water, gently brushed on the inked surface with a wet camel's hair brush. The ink gradually comes off, but in order to save time it is often desirable to employ a little warm water, and, at the same time, continue to use the brush. Now, the end of the matter is, that the printers' ink becomes removed from all those parts of the paper which were not exposed to the action of light, and an image in fatty ink is thus obtained on the gelatinized paper. From this the excess of water is now removed by means of blotting paper, and the print, inked face downwards, is laid on a clean and slightly warm lithographic stone. The stone and paper being now passed through the press, the paper adheres firmly to it, but on moistening the paper with a sponge it becomes easily removable. When stripped off, the fatty ink is fixed on the surface of the stone, leaving a perfect but reversed image thereon. All is now ready for the lithographic printer, who gums and etches the stone, as a preliminary to the ordinary printing process.

Instead of putting the photo-lithographic transfer down on a lithographic stone, it may be put down on a zinc plate, and the plate can be printed from, if treated exactly as the stone was treated.

In its usual form, photo-lithography is only adapted for the reproduction of line subjects, or subjects in extreme black and white, and various attempts have been made to render it available for the reproduction of the gradations of a negative taken from nature. By a modification of Asser's starch process it is easy to get results which are excellent renderings of half-tone as a grain or stipple. A sheet of blotting paper is covered with ordinary flour paste, containing

8 per cent. of flour. The paper having been coated, it is next smoothed with a soft badger brush, and when dry the paper is soaked in a $3\frac{1}{2}$ per cent. solution of potassium bichromate, in order to make it sensitive to light. This piece of sensitive paper being placed under a negative, and exposed to the light of burning magnesium for a few minutes, or to daylight for a longer time, soon becomes tinted with a brown color where acted on by light, as you see. The light brown print is next soaked in cold water, in order to remove the unaltered portion of the potassium bichromate, after which it is dried and hardened with a warm flat iron. This last operation is to harden the coating. I now put the ironed print into water, take it out, lay it on blotting paper, and dab on printers' ink with a stiff brush. The ink adheres to those parts where the bichromated paste has been made insoluble by the action of light, and it refuses to adhere to those parts where the paste remains soluble. In this way a fatty transfer is obtained, which shows all gradations of a negative taken from nature, not, however, as a true half-tone, but as a grain or stipple well adapted for transferring to stone or zinc. As a fine image of this kind is liable to get clogged up when printed from stone, it is better to transfer it to a plate of zinc, and to make a typographic block from this by the etching method.

PHOTOTYPIC BLOCKS.

A fatty ink transfer, similar to that which is commonly put down on a lithographic stone, can be transferred to a smooth and clean zinc plate, and the ink firmly adheres to the zinc, just as it would to the stone. A treatment with gum now protects the clear parts of the zinc plate against the adhesion of printing ink, and the application of the ink roller adds more ink to the fatty image already on the surface of the zinc plate. So far the process resembles the photo-lithographic process; but instead of printing from the zinc plate, powdered resin is dusted over it, in order to give firmness to the fatty image. The zinc etcher next very slightly warms the plate to make the resin and ink partially blend, and then puts it into dilute nitric acid, containing one part of acid to about forty parts of water. Here it remains for about three minutes, during which time the acid dissolves away those parts of the metal which are not covered by the waterproof coating. The covered parts now stand slightly in relief, but only very little, and if we were to continue the etching without further preparation, the acid would gradually undermine the lines, and the image would be lost. Now, the undermining action of the acid can be easily prevented by washing the plate, drying it, and then heating it sufficiently to just melt the resin. Under these circumstances, the melted resin blends with the printers' ink, and runs down over the sides of the little ridges left by the etching, and protects these sides from the further action of the acid. Having done this, it is well to gum the plate once more, ink again, dry, and dust with resin before proceeding to another etching. This second etching may be done with stronger acid than the first, say one of nitric acid to thirty parts of water, and it may be continued longer, say for six or seven minutes, and when this second etching is finished, the series of operations must be repeated until sufficient depth is obtained, care being taken that the melting of the resin is only carried far enough to allow it to flow just over the sides of the relief left by the previous etching. In ordinary cases, ten etchings are enough to give the necessary depth, but in the case of important work it may be necessary to give twenty or thirty very slight etchings in order to obtain the same depth, without endangering very fine lines or details.

The process of zinc etching has been largely employed for the production of typographical blocks from fatty transfers, either drawn by hand or printed, and this phase of the process bids fair to compete successfully with the art of wood engraving.

There are other methods of producing phototypic blocks, among which may be specially mentioned the method which is founded on the swelling of gelatine. Mr. Dallas's blocks are done by a process of this kind, but the details have not been made public. Mr. Dallas was the first to introduce phototypic blocks into the English market, and if you carefully examine some of his specimens you cannot fail to be struck by the fineness and perfection of the details.

By the following modification of the swelled gelatine process I have succeeded in overcoming many of the difficulties of the methods already published.

We start with some clear sheet gelatine, about $\frac{1}{30}$ of an inch in thickness. This can be prepared by drying a layer of gelatine solution on a sheet of waxed glass, or it can be purchased from Mr. Cornelissen, of Great Queen street. To make this gelatine sensitive to light, it is soaked in $3\frac{1}{2}$ per cent. solution of potassium bichromate until it becomes flacid; it is then laid on a piece of clean glass, and the excess of solution is removed by an application of the squeegee. The plate bearing the wet gelatine is then placed in a warm and photographically dark place to dry, and when dry it can be easily separated from the glass by raising one corner with a pen-knife. We obtain in this way a flat sheet of sensitive gelatine, having a smooth surface and all ready for exposure under the negative, and this exposure may last from ten to twenty minutes in sunshine, or a correspondingly longer time in the shade.

I now take the exposed film and put it into water to soak, and those parts which were protected from the light begin to swell immediately, while the exposed parts refuse to swell in the water. The soaking should last several hours, but as we cannot spare that time I will take a gelatine which has already soaked the necessary time, and make a cast from that. For this purpose I lay the wet gelatine film on a piece of glass, exposed side upwards, and squeegee it down as before—you see that it adheres to the glass quite easily—and after having made it surface-dry by dabbing with a soft cloth, a little oil is applied, and distributed over the surface. Now that the excess of oil has been removed by a soft cloth, I pour on plaster of paris to a thickness of about an inch, taking care to remove any air bubbles by the application of a camel's hair brush through the liquid plaster.

This plaster will take about ten minutes to become solid, and if we violently tear the plaster and the gelatine apart, the fine details of the cast are almost sure to be damaged. But, instead of doing this, a good plan is to hold the glass plate in one hand, and gently push the plaster cast with the other. Now the gelatine slowly slides over the glass, and finally it will slide quite off, the gelatine still being adherent to the plaster. It is now merely necessary to turn up one corner of the gelatine film, and slowly fold it back, so as to draw it off the plaster gently, and without fear of damage, either to the gelatine relief or the plaster, just as a lithographer draws a thin paper proof from the stone. The next step is to make a cast in stearine from the plaster, and for this purpose the plaster should be soaked in rather warm water, about 50 degrees centigrade, and on this soaked and warm plaster a layer of stearine, about an inch thick, should be cast. The stearine cast is now dusted over with blacklead or bronze-

powder, and is then put into the electrotyping bath, and when a sufficient quantity of copper has been deposited it is merely necessary to back up with type metal, and mount on a wood block, the work being then ready for the typographic press. If the process I have described is gone through with an ordinary half-tone negative an exceedingly beautiful electrotpe is obtained, in which the gradations of light and shade are represented by varying degrees of relief. These, or even plaster casts, ought, I think, to have a very good sale, if photographers would only take the matter up. The ease with which they can be made is surprising.

I may mention that, instead of taking a cast from the plaster in stearine, gutta-percha may be used, a press being employed to force the plaster cast—which should be in an iron chase—into the soft gutta-percha.

The depth of the relief obtainable by the swelled gelatine process is about equal to that of an ordinary visiting card, and where large surfaces of white occur, it is necessary to deepen the plate in these parts. This may be done either by cutting out the metal from the finished plate, or in most cases more conveniently by raising the surface of the mould, let it be wax, stearine, or gutta-percha, on which the electrotypic copper is to be deposited. This is best done by holding a stick of stearine or wax in the left hand, and a warm pencil of metal in the other hand, and so holding the wax or stearine as to let a thin melted stream flow down the warm pencil. This stream is allowed to flow on those parts of the mould which require raising.

(To be continued.)

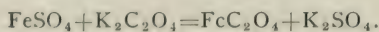
PHOTOGRAPHIC CHEMISTRY IN OUTLINE.

BY HUGH MARSHALL, B.S.C., F.R.S.E.

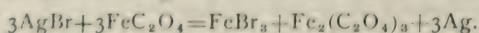
[Read before Edinburgh Photographic Society.]

(Continued from page 458.)

THE only other developer of importance is the ferrous oxalate. All ferrous salts act more or less as reducing agents. Ferrous sulphate (green vitriol or copperas) will precipitate metallic silver from a solution of the nitrate. Hence its use in wet plate development. For dry plates, however, a solution of ferrous oxalate is generally used. This salt is not soluble in water, but is in a solution of alkaline oxalate. If ferrous sulphate be added to a solution of potassium oxalate, we get double decomposition, ferrous oxalate and potassium sulphate being formed.



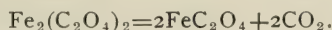
This ferrous oxalate remains dissolved, up to a certain point, in the excess of potassium oxalate, forming a double salt. Beyond this point the addition of ferrous sulphate produces precipitation of ferrous oxalate, the excess of potassium oxalate being removed. For this reason, also, the potassium oxalate should not be added to the ferrous salt, as precipitation would then take place at once. Once the ferrous oxalate has separated out, it can be redissolved only with great difficulty. The action of this developer depends on the tendency of the ferrous salt to oxidize to ferric, and we get ferric oxalate and haloid formed, thus :



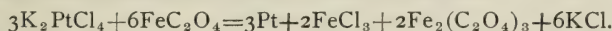
In keeping ferrous sulphate it is necessary to observe that, in solution especially,

it takes up free oxygen, becoming converted into ferric salt, which is of no use as a developer, but seems to act rather against the operation.

There are two other uses of iron salts which may be mentioned here, though they belong rather to the domain of printing operations. The first is the use of ferric oxalate in the platinotype process. If a piece of paper be coated with ferric oxalate and exposed to light, under a negative, say, wherever the light acts, we have decomposition occurring, ferrous oxalate and carbonic acid being formed.



If this print be now floated on a solution of ammonium oxalate, we will have solution of the ferrous salt occurring with formation of a ferrous oxalate developer. If we had any easily reducible body also present it would be immediately attacked where such a developer was formed, and, therefore, where the light had acted. The amount of reduction would be proportional to the amount of ferrous salt present, and this in turn, up to a certain point, would be proportional to the amount of light acting. This is the principle on which the platinotype process depends, a platinum salt being the easily reducible substance employed. In the hot bath process this salt (potassium chloroplatinite, K_2PtCl_4) is spread upon the paper. In the later cold bath process it is mixed with the ammonium oxalate solution. The reducing action here is precisely analogous to the action of an ordinary ferrous oxalate developer, as above stated.



It will be seen that the ammonium oxalate is not the true developer, but acts only as a solvent for it. As we would expect, from the nature of the process as above stated, fine detail is apt to be lost in platinotype printing. Its redeeming features are its simplicity, and the beauty and permanence of the results obtainable. Metallic platinum is not in the least affected by any ordinary impurity in the atmosphere, etc., so that, under normal conditions, the life of a platinotype depends solely on the permanency, or otherwise, of the support which holds it.

(To be continued.)

OUR ILLUSTRATION.

THE handsome photo-gravure with which we illustrate this issue of the BULLETIN is a reduction from the beautiful picture of Mr. H. McMichael, the President of the Photographers' Association of America. The original was exhibited at the Boston Convention, and is undoubtedly among the most artistic and perfect pieces of photography that we have ever seen. The exceedingly graceful and natural arrangement of the figure, the very skillful use of accessories, together with the admirable management of the light to produce modeling makes the production a *chef d'œuvre* of photographic art. The photo-gravure reproduction is one of the most perfect we have undertaken, and gives an excellent idea of the original.

A GOOD POSITION.—John Digg (to classmate)—Well, Jack, college days are over. What are you going to do for a living?

Jack Fastsett—Been engaged by Ritch & Co.

“What for?”

“Son-in-law.”

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.O.S.,**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

PHOTOGRAPHERS' AND ARTISTS' MUTUAL BENEFIT ASSOCIATION.

CONSTITUTION.

(Continued.)

He shall have power to provide himself at the expense of the Grand Council with such books, papers, stationery and postage as are necessary for the proper fulfillment of his duties, and he shall perform such other duties as may be required by the laws and regulations of the society and as the Grand Council or the Board of Trustees may from time to time direct.

SEC. 4. The Treasurer shall receive from the Secretary all moneys received by him for the use of the Association, giving his receipt therefor; pay all orders drawn on him by the President and properly attested by the Secretary and stamped with the seal of the Grand Council, and none others; keep the accounts in a proper manner, showing the amounts and sources of receipts, and the amounts and purposes of disbursements, and shall give a statement thereof in writing at the annual session or whenever requested to do so by the

Grand Council or its Board of Trustees. Before entering upon the duties of his office he shall give such security for the faithful performance of his duties as the Grand Council or its Trustees may deem satisfactory, which bond may be increased during recess by the Trustees, and deliver the books to the Finance Committee for examination whenever it may demand them.

At the expiration of his term of office he shall deliver all books, papers and moneys (belonging to the Council, and in his possession, or for which he is responsible) to his successor when declared qualified by the President.

In making his annual report he shall state the total amount of money received by him and from what source, together with the amount expended, to whom paid, the date of payment and for what purpose, the name of the person or persons receiving said moneys to be given in connection with the number of warrant or order drawn.

The Treasurer shall furnish his report to the Committee on Finance at least one week before the meeting of the Council.

SEC. 5. The Trustees shall have supervision of the Funds and charge of all properties of the Council.

They shall give their bonds to be approved by the President. The Board of Trustees, by majority thereof, shall approve of the bonds of all other officers.

ARTICLE III.

Membership.

SECTION I. Any person of good moral character, who shall comply with the rules and secret workings for the initiation of members, shall be entitled to membership in the Grand Council.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the above-named society was held on the evening of September 27th, at the Masonic Hall, Yokohama. The chair was occupied by Lieutenant Bull. The meeting was of a technical character; that is to say, it was for the purpose of exhibiting anything that might be considered in any way new in connection with photography in Japan.

The following gentlemen were elected members of the Society: Mr. Kusaka, Mr. M. Nakashima, Mr. B. Hayashi and Mr. B. H. Pearson.

After some formal business had been concluded, Mr. Kajima exhibited several cameras

of English design and Japanese manufacture. These were cheaper than the corresponding English cameras, and the workmanship was generally pronounced to be very creditable.

Mr. K. Ogawa showed some remarkably fine colotype prints, and briefly described the process. The printing is done in a press directly from a plate that has been prepared with a sensitive surface of gelatine and bichromate, and that has been exposed under a negative. The parts that have been insolated will take a fatty ink, the others will not, and it is thus possible to ink up the plate and to draw proofs from it. Several hundred proofs can be drawn from one plate, and an indefinite number of plates can be made from one negative.

Mr. C. D. West showed an arrangement that he had designed for taking photographs of one boat from another. The arrangement consists essentially of a bracket that can be fixed to the main or fore-mast of a sailing boat, and a universal joint with arrangements for holding a camera which may be aimed at any object and caused to follow it till an exposure is made. Some examples of photographs taken by the aid of this apparatus were shown.

Mr. W. K. Burton showed silver prints made on Whatman's drawing-paper and on very thin Japanese paper. The process consists in coating the paper with an emulsion of resin and gelatine, in which is dissolved, a small quantity of a soluble chloride. The paper is then dried, and is sensitized with an ammonia-nitrate of silver solution, the sensitizing being twice repeated in the case of the drawing paper.

Mr. Kajima showed some Japanese fans which were decorated with photographs produced directly on the paper of which they were made. These were much admired.

Messrs. Cocking & Co. sent a large and interesting exhibit of lenses and other photographic apparatus. Amongst the things shown were a very fine camera by Meager & Co., of London, and lenses of Suter and of Dallmeyer, the latter including several of the new "rectilinear landscape lens."

Mr. Konishi showed a sample of the new developer "Eikonogen," and the Chairman promptly ruled that it should be appropriated by the Society, and that certain members should be appointed to experiment with it and to report to the Society on the results of the experiments. Messrs. K. Ogawa and W. K. Burton were instructed to undertake the experiments.

The meeting concluded with a vote of thanks to the lender of the Hall and to the Chairman.

The next meeting will be held on the 13th October. It is to be a camera field-day, and the place selected is Kamakura. No particular hour is fixed, as it is hoped that some will be able to come early in the morning, and there is no reason why camera work should not be kept up through the whole day. Probably some members will extend their trip to Enoshima.

AMERICAN INSTITUTE — PHOTOGRAPHIC SECTION.

REGULAR MEETING, NOVEMBER 5, 1889.

President H. J. NEWTON in the chair.

Mr. O. G. MASON announced the titles of journals and papers received for the Section since its last meeting, for which the usual vote of thanks was tendered to the contributors.

The Executive Committee announced that an informal meeting of the Section would be held in the Trustees' rooms of the Institute, November 20th, at 8 o'clock P.M., to which all interested in photography were cordially invited.

A regular meeting of the Section would be held December 3d, at 8 o'clock P.M., and a portion of the evening devoted to a stereopticon exhibition.

President NEWTON then announced that the programme of the evening was an exhibition of slides made from negatives taken during the summer vacation by members and friends of the Institute. And that such an exhibit should be so conducted as to be educational, and the pictures shown should be subject to criticism while on the screen. If a bad slide was exhibited, the reason why it was bad should, if possible, be explained, and the plate and process given when good ones were exhibited, together with the method by which such pictures were made.

Mr. NEWTON also said he should like to say something about the eikonogen craze, for the great excitement about this new developer he looked upon as a kind of craze! New things that have merit in them are apt to work in this way! He had tried this new product and found some things in it different from hydroquinone; some better, and some not as good. The advantage of eikonogen consisted in its more rapid starting of the development, but it did not have the staying qualities of hydroquinone. His best results

had been obtained by combining the two in the following way :

Soda sulphite.....	30 grains.
Soda carbonate.....	20 "
Caustic soda.....	3 "
Soda bromide.....	$\frac{1}{2}$ "
Hydroquinone.....	2 "
Eikonogen.....	3 "
Water.....	1 ounce.

This formula, compounded in the order above given, has in his hands, proved to be perfectly satisfactory, and he therefore commends it to notice. It has the rapid action of the eikonogen with the sustaining energy of the hydroquinone. It keeps indefinitely, and can be used repeatedly without any additions or modifications.

A good formula in using the eikonogen above is :

Soda sulphite.....	30 grains.
Caustic soda.....	3 "
Eikonogen.....	5 "
Water.....	1 ounce.

It is not practical to mix hydroquinone with this as it causes the developer to turn very red in a few days, and in a few weeks garnet-colored, though it still retains its developing power, with a tendency to slightly color the negative.

At the close of the above remarks Mr. Fisk exhibited a series of pictures made by Mr. Newton while spending his summer vacation at South Nyack, Rockland County, N. Y. These views attracted marked attention and revealed to many the pictorial effects the camera can produce when in the hands of an artist skilled in the mysteries of photography.

The next presented were scenes on board an ocean steamer, and in Scotland and England, by T. B. Mills.

These were followed by scenes in Connecticut and Vermont quarries, by S. J. Huntington; Ocean Steamer, by J. M. Hood; and the exhibition was closed with some selected views of the centennial pageant, by A. D. Fisk.

Mr. O. G. Mason made some very appropriate remarks concerning the excellence of the exhibition, and the relation between photography and art. After which the Section, on motion, adjourned.

LYNN CAMERA CLUB.

THE regular monthly meeting of the Lynn Camera Club was held at 40 Broad street, Tuesday evening, November 5th. The Executive Committee report that the club is a member of the New England Lantern Slide Exchange, which now contains seven clubs,

and slides from them will be shown at the club-room during the coming winter. The Secretary showed a copy of the By-Laws of the Chicago Camera Club, which is well gotten up and a credit to that organization. The Committee on Entertainment state that W. G. Chase has kindly offered to deliver his illustrated lecture on "Life Among the Shakers" for the benefit of the club; also that C. H. Currier has offered to deliver some of his recitations, both of which were accepted with thanks, and the entertainment will be held on the 21st at Y. M. C. A. Hall. Tickets may be obtained of the members. The proceeds will be used in furnishing the new club house. An application for active membership was received from R. L. Almy, and he was unanimously elected.

ST. LOUIS CAMERA CLUB.

A MEETING of the St. Louis Camera Club was called to order by the *President* BAIN with 21 members present.

The minutes of the last meeting were read and approved as read.

Mr. Butler moved that honorary members have only the privilege of attending meetings and entertainments.

Motion carried.

The membership committee recommended the election of Mr. Julian Laughlin as an active member of the club. After balloting he was declared unanimously elected.

The name of Mr. George B. Compton was proposed for secretary of the club. After balloting, Mr. Compton was declared duly elected.

Applications from Messrs F. A. Banister, proposed by Mr. H. B. Alexander; G. W. Gilson, proposed by Mr. Bain; H. A. Benoist, proposed by Mr. Valle, for active membership, were read and referred.

Messrs. Max Tamm and R. J. Compton, proposed by Mr. Holman, Mr. Jacoby, J. C. Somerville, and A. V. Reyburn, proposed by Mr. Bain, were elected honorary members, and the M. A. Seed Dry Plate Company proposed by Mr. Holeman, and Mr. Charles C. Kilgen, proposed Mr. Bain associate members of the club.

Mr. H. B. Alexander moved that the Executive Committee be authorized to expend in building and fitting up a dark room not more than \$100, which shall be appropriated from the club treasury.

Motion carried.

Upon motion meeting adjourned.

After the meeting had adjourned, the Eastman-Walker roll-holder with improvements, was exhibited by Mr. Seth C. Jones. After enlarging on the merits of the roll-holder, Mr. Jones proceeded to cut off a piece of film which was in the roll-holder and developed it for the information of the members. After fixation it was passed around for examination. When the lights had been turned up Mr. Jones passed around a number of film negatives, and several finely mounted prints made from same, also a number of large bromide prints and other specialties.

After the demonstration by Mr. Jones, a number of lantern slides contributed by the members were exhibited.

GEO. B. COMPTON,
Secretary.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held on Wednesday evening, November 6, 1889, the *President*, Mr. FREDERIC GRAFF, in the chair.

The *Secretary* reported that at the Conversational Meeting, October 16th, Mr. Milburn, of the Eastman Dry Plate and Film Company, exhibited before the Society the new Eastman Transparent Films, and gave a practical demonstration of their use and development.

The film consists of an exceedingly thin and transparent support, coated with a highly sensitive gelatine emulsion. One of the chief characteristics of the film is its flexibility, which adapts it for use on roll-holders in the same manner as the company's old film in which paper was the support. It has the further great advantage, however, that no stripping, oiling or other after processes are necessary; it being treated in all respects practically like a glass plate. After the final washing it is soaked for a few moments in a special solution of glycerine, alcohol and water, which prevents its curling or cockling in drying. It is then pinned up on any perpendicular surface to dry.

The Committee on Membership reported the election of the following active members: Philip F. Fulmer, Jr., Stephen Minot Pitman.

Mr. Walmsley showed Eastman's Kodak Camera, No. 2. This little box is precisely the same in outward appearance as the well-known Kodak that has been before the public during the past year; differing from it only in size. The older form makes a picture $2\frac{3}{8}$ inches in diameter; the new one, or No. 2, $3\frac{1}{2}$ inches. The lens has a fixed focus, all subjects for five feet distance being sharply delineated. It has also a diaphragm shutter, easily rotated, which gives three (3) sizes of openings, thus greatly increasing the efficiency

of the instrument in time work on interiors, etc., and also where great excess of lighting prevails, as in seashore views, etc. The camera is loaded with the new "Transparent Film" for one hundred exposures, requiring no stripping, and being treated in all respects the same as a glass plate. A view finder is attached to the front of this camera, enabling the operator to see what he exposes upon at the moment of so doing. Mr. Walmsley also exhibited a number of negatives, made from his own exposures with this camera, as well as prints and lantern slides for same, all of which showed great capacity in the camera and lens.

A fine view camera, using 5×7 plates, and made also by the Eastman Company at their London works, was also shown by Mr. Walmsley. This camera and its accessories combine the most recent advances in this direction, regardless of labor or cost, and in all respects seem suited to the requirements of the most exacting demand. The entire outfit, consisting of camera and three plate holders, was made of the finest Spanish mahogany; the box itself folding with a thickness of one and a half inches when closed. At the same time the perfectly rigid bed was capable of sufficient extension to admit the use of a lens of 19 inches focus. By an ingenious arrangement the back could be advanced towards the front, so as to permit the use of wide angle lenses of very short foci, without including the bed plate in the field of view, as is the case with all cameras in which only the front can be moved to and fro. A single swing back only is provided; but the front is so constructed as to permit of a very wide lateral swing to same, whilst the rising and falling front has a very wide limit of adjustment. The back is reversible for horizontal or vertical exposures. The bellows are of fine leather, cone shaped. The folding tripod legs are attached directly to the base box of the camera by a revolving brass carrier, and both back and front are provided with automatically moving pendulum arms for leveling the camera. The focusing is effected by a finely-cut rack and pinion, controlled by large drilled heads, and the entire workmanship is the best that London's skilled workmen can furnish. The plate holders (three in number) are of the folding or book form, with the slides hinged to fold back on withdrawal, as usual in the English form of cameras, but the leakage of light through this joint, so often complained of in this form of camera, is entirely avoided by the employ-

ment of a double rabbet at the joint, which precludes the possibility of any light entering thereat. In short, this camera is made and intended to be in all respects the most perfect in workmanship that can be provided, whilst in design it speaks for itself. The whole outfit is carried in a water-proof canvas case, with sling straps, as in a knapsack. It is made in three sizes: 4×5 , 5×7 and $6\frac{1}{2} \times 8\frac{1}{2}$.

Mr. Joseph M. Wilson related some interesting experiences in connection with a trip made through several European countries during the past summer. He carried with him a Scovill hand camera and material for about seven hundred exposures, most of which was made use of before his return. The camera, in which several ingenious modifications and improvements had been made by Mr. Wilson, was shown, and also a light and convenient alpenstock tripod of his own design, which had been carried throughout the trip.

Dr. C. L. Mitchell showed a Blair Compact Camera, mounted on a single leg or "Unipod," for use in instantaneous work in situations where a regular tripod could not conveniently be set up, and where more steadiness was desirable than could be maintained by holding the camera in the hand. With a large camera on board a yacht, or in street work, when sitting up a tripod would attract a troublesome crowd, the unipod had been very useful.

Mr. Wilkinson showed a hand camera obtained by him in Germany, the invention of Dr. Krugener. Glass plates $3\frac{1}{4}$ inches square were used, thirty being carried on the camera. The box was of oblong shape, about a foot long and four or five inches square. The camera proper was in the center of the box, the lens opening being at the side. Before use the plates were contained in a magazine at one end of the box, and by an ingenious contrivance, after each exposure, the plate used was removed to a second magazine at the opposite end, and a fresh plate brought into place ready for the next exposure. The operation was continued until all the plates were exposed and transferred.

Mr. Francis Burrows also showed a new hand camera of his own design, which he described as follows:

I present to you this evening another candidate for your favor. "The Ultimate," a 4×5 hand camera. It is compact, measuring $5 \times 5\frac{3}{4} \times 9$ inches, and yet by drawing out the telescopic front, it will accommodate an eight inch focus lens.

The front of the box opens, allowing access to the lens and shutter, while in the rear of the lens a flap shutter may be closed during this operation. This box is fitted with a 4×5 Pantagraph lens of $5\frac{3}{4}$ inch focus, and working $f-6$ approximately.

The shutter is of the rotary type, but is peculiar from the fact that its movement is always in the same direction. A small crank on the front board sets it by a part revolution, and a little farther movement of the same exposes; by this means the shutter is set without exposure of the plate, and generally at the last moment. With the spring at this tension the exposure is rapid enough to make all ordinary work, including landscapes, marine views, or animals. However, the shutter disc is double, and by releasing this small catch one-half may be revolved independently of the other, thus, you see, making the effective opening in the shutter one-half, one quarter, or one twenty-fifth of its full size, and so giving the same fraction of the ordinary time of exposure. By releasing the spring the disc may be entirely revolved by hand, and the exposure timed. The opening and closing by this method being one simple movement, it is practicable to make the exposures very short.

On the bottom of this box you will notice a tripod plate and fitting for a finder. They do not belong to the box, but were placed on this, my model, for experiment. For those who wish such additions nothing can be more simple.

The rear compartment, opening at the bottom, contains a new locking arrangement, which holds one plate holder rigidly in place, while the other three drop loosely in back of it. A slight pull on this lock loosens the plate holder and lifts it out, while a strong pull draws the entire mechanism from its place, and makes place for a $3\frac{1}{4} \times 3\frac{1}{4}$ Eastman roll-holder, which slides into its bed with slight pressure.

The plate holders are of new design, very small, and of metal; they are double, and are loaded by removing boat slides and the movable plug from the top. As any lens from $4\frac{1}{2}$ to 8 in focus may be fitted, the question of focusing comes up. With this lens the front is drawn out about three fourths of an inch, and there is a line drawn. In this position the lens cuts sharply to within about twenty feet. With an $f-8$ or $f-11$ stop everything beyond this distance is sharp. Practically I make all views at this point. About one-sixteenth of an inch back of this is another line. When drawn out to this we get better foreground

effects, but the horizon will not be quite distinct, and should not be allowed to show unless it is possible to use a stop, as, for instance, a well-lighted subject, or one allowing time exposure.

In case I find it necessary to time a plate I am generally able to find something to place the camera upon—a railing, bench, or stone—or I have made very sharp photographs of several seconds' exposure by holding the box firmly against the side of a house or tree. For those who will carry a tripod I can suggest nothing better.

On motion, the meeting adjourned.

ROBERT S. REDFIELD,
Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—G. T. K. writes: I inclose a photograph of a daughter of mine, taken in the back-yard, which I wish you would criticize; and let me know what my faults are, and please state how they can be corrected.

A.—The work is excellent from a photographic point of view. Artistically we should prefer a more picturesque background than a board fence. Nevertheless we can understand that as a first effort you were not particular about anything but the subject; thus far the work is good.

Q.—C. R. A. writes: Please tell me if I can successfully use electric light with the Cooper lantern? If so, how much power will be needed with the 10-inch lantern; *i. e.*, how much candle power will I need?

A.—You may use either incandescent or arc electric light in the Cooper lantern instead of the regular lamp. The arc light is best, using a good regulator for the carbons. If these carbons are used in a small size, one hundred candle power may be used. If the incandescent light is used select a lamp having a spiral carbon of small area and then fifty candle power may be obtained. In the latter case the lamp must be constructed specially to carry the current, or the carbon will be destroyed.

Q.—W. F. T. writes: Would you please answer the following questions through the

columns of the BULLETIN. What is the widest angled lens that can be used on a Blair "Champion," without the front part of the bed showing in the picture? At what price can I obtain back volumes of the BULLETIN, say from 1880? The BULLETIN and "Annual" are enjoyed. I have been trying some "Aristo" paper, but have been troubled by the paper and film separating. The water was not warm, neither were they handled rough. Directions followed closely. A print spoiled as above referred to I will mail to you. Will you please tell me how to remedy it. I have some much more spoiled, but the one sent will give you an idea of what I refer to. I have also had some trouble with silver prints turning from a rich purple to a dark yellow, or light brown, when put into the fixing bath. Fixing bath composed of

Hypo..... 5 ounces.
Ammonia..... $\frac{1}{2}$ dram.
Water..... 20 ounces.

The toning bath is acid. Should a toning bath be acid, and if so, how much ammonia should I use in the fixing bath? Could you give me the formula used to get the tone shown on the front page of No. 3, Vol. 20, of the BULLETIN? In answering L. F. D., who asked the above question, you referred him to Ulrich of New York, but did not give his street No. A print changed from a purple is inclosed. The U. S. S. "Nipsic," from Samoa, is tied to the wharf, shown on the right side of the print; the U. S. S. "Adams" and U. S. S. "Alert" are also shown.

A.—A wide angle lens will embrace an angle of about 90 degrees, and a rapid rectilinear lens only takes in about 60 degrees; from these figures you can calculate whether the bed of the camera would show, if you know the focal length of the lens. Bound volumes of the BULLETIN cost \$4.75, postage paid. The trouble with the Aristo paper appears to be that it is flawed on paper that was not properly prepared to receive it. Your toning bath should be alkaline with sodium bicarbonate, this is the cause of change of color of prints. Ulrich, photographer, 156 Bowery, N. Y. City, will find the maker of the prints you refer to.

Q.—E. T. W. writes: Can you advise me what sort of a lens reflector, etc., and arrangement, could be cheaply devised for throwing the image of carbons burning in an arc light, magnified slightly, on a screen, where it can answer to test arc, length and quality of carbons, etc.

A.—Arrange the carbons in front of the condensor and focus, with lime light behind

them, then turn on the current, and the arc can be seen on the screen. The size of enlargement depends on the focus of the lens used as an objective.

Q.—H. B. W. writes: Please inform me, through BULLETIN, whether or not a city or county has a right to impose a license on photographers, or is there anything in the laws of the United States to prohibit it.

A.—We do not know of any laws either for or against the imposition of a license on photographers. We presume the local authorities have the power to impose one if they choose.

Q.—C. F. writes: Will you kindly inform me, through your paper, what the reason is that all my negatives are too harsh; there is not enough half tone or half light. Enclosed you will find one where the light is the kind I should like; and also one where I think the lights are too harsh. Please answer if it is in developing of plates or in lighting of the subject.

A.—Your trouble appears to be in the lighting of the subject. You have too much light on the bright side and not enough on the shadow side of the figure which you send a print of. You should also endeavor to get some light behind the subject to give relief.

Views Caught with the Drop Shutter.

Mr. LEON VAN LOO, of Cincinnati, O., recently gave us a call, on his return from Paris. He landed in New York from the steamer "Noordland," and has been absent since June last. After his travels he returns

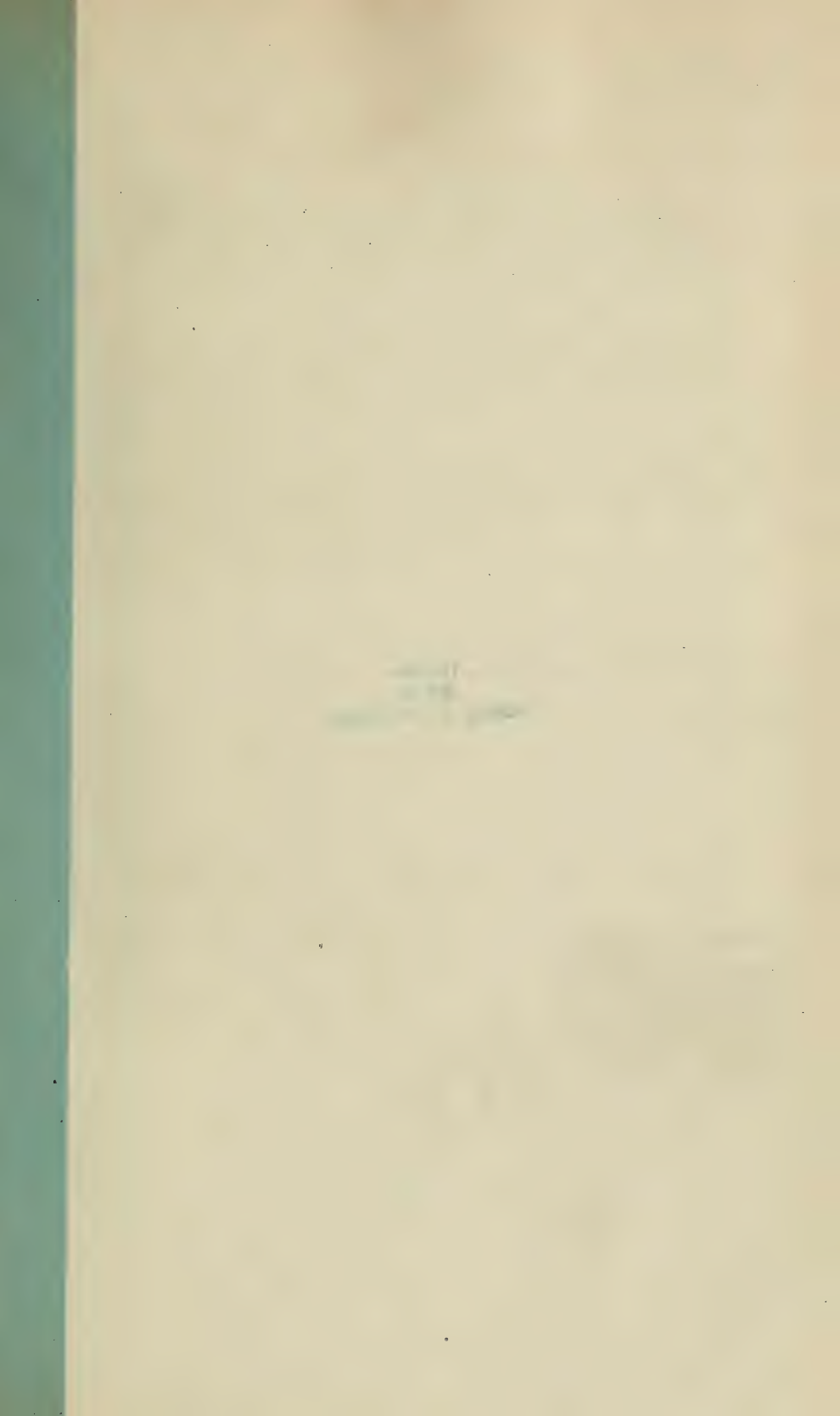
to the United States with the firm belief that, after all, here is God's acre.

We note another addition to the constantly increasing list of photographic papers. The new comer is *The Photographic Herald and Amateur Sportsman*, issued at Loeber Bros., of New York. It is devoted to amateur photography and out-door sports. It is a small octavo of eight pages, consisting of short selections from the journals.

AMATEUR PHOTOGRAPHY.—I recently made a short trip into the country, and took with me the beautiful little "Lilliput" camera which is so portable that it can be carried in a good-sized coat pocket. It contains six double plate holders, so that twelve views can be taken, and the plate holders are so small that a dozen more plates can be carried in the pocket. No focusing is necessary, for this wonderful lens appears to accommodate itself to all distances like the human eye. You have merely to point the camera at the object or scene intended to be photographed, touch a little spring and the deed is done. On returning home you have to place the plates in a developing solution and then in a fixing bath, and you have the perfect negative from which any number of pictures can be taken. Those not desiring to complete the process themselves can send the exposed plates to a photographer, who will hand you ready mounted copies for a nominal price. I think the completion of the process the most interesting part, and it is so simple and easy that all (lazy people excepted) should do it themselves.—John Michels, late editor of *Science*.

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PRINTED ON N. P. A. EXTRA BRILLIANT ALBUMEN PAPER.

A STUDY

BY

O. P. SCOTT, CHICAGO, ILL.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

DECEMBER 14, 1889.

Vol. XX.—No. 23.

THE BULLETIN FOR 1890.

WITH the new volume of this journal we shall celebrate the coming of age of the modest little monthly first edited by Mr. H. T. Anthony. In looking over the past twenty volumes of the BULLETIN we feel that our efforts to advance photography have not been put forth in vain. As volume after volume has appeared, there is to be noted a marked improvement, both in the matter of technical execution and in the quality and quantity of photographic information to be found in its pages. There is not another American journal that gives its readers such a large amount of good, useful and interesting photographic information as the BULLETIN, and at such a moderate price. Our constantly increasing subscription list tells us that we have accomplished something in the line of photographic literature which is being appreciated. We believe that we now have the largest circulation of any American photographic periodical. Nevertheless our sphere of usefulness can be greatly enlarged by still further additions to our list of subscribers. Every new subscription makes it possible for us to add some new and useful feature to the journal.

During the past year the pages of the BULLETIN have been enriched by contributions from the pens of some of the best professional and amateur photographers of America. Our German and English correspondents are without rivals in their respective countries, and their letters are copied in many of the English and other European journals. In this particular department we often present to our readers information that they cannot obtain in any other photographic journal until it has been copied from our pages many weeks after its appearance. We are also constantly receiving photographic information from many remote parts of the world, in the form of notes and letters that appear in the editorial pages.

We have also constantly kept our readers informed of the advances of photography by many valuable translations from foreign photographic journals, another feature of the BULLETIN not attempted on a like scale by any other photographic periodical.

With the facilities for translation which we possess, and with the scientific supervision of these by the editors of the journal, we doubt if there is another photographic journal, American or English, that surpasses us in this particular department.

Yet another important feature of the BULLETIN is the reports of the various photographic societies, which keep our readers posted upon topics under discussion in all parts of the United States and Canada, including the Sandwich Islands and Japan. In this department, also, we are not surpassed by any other photographic journal.

In the matter of illustrations there is not another American journal that gives its readers such a valuable collection of pictures as appears in the twenty-four issues of the BULLETIN. These illustrations it would be impossible to produce and give to the subscribers of the BULLETIN, except for the large facilities that we have for their production and the large number needed for each issue of the journal. These pictures alone are worth more than the subscription price of the BULLETIN to every progressive photographer. They represent the best work of the best professional photographers, as well as that of the most enthusiastic amateurs. In looking back over these illustrations we are proud of them, and sincerely thank our many good friends who have furnished the negatives for the work. We feel honored in being able to present their achievements to the world.

The correspondence department of the BULLETIN still continues to be an interesting and important feature of the journal. These crowded columns from inquiring friends are all *bona fide* letters, and not made up in our editors' room, as is the case in many journals. Usually we have many more of these in the hands of the editors and their staff than can be answered in any single issue of the journal.

Our readers will see how much work and care is used to make the BULLETIN what it has been called, "The leading photographic journal of America." And every effort will be made in the coming year, not only to maintain the high standard it has attained, but to raise it to still higher levels of usefulness as a photographic journal. To this end no expense or trouble will be spared. We do not offer any special premiums to induce subscribers to add their names to its lists. We shall give them the best value for their money in the columns of the journal—not in spasmodic efforts, but in a steady flow of useful, interesting and accurate photographic information.

Those who believe in this policy should renew their subscriptions at an early date, and recommend the BULLETIN to their friends who are not on our subscription list.

If you will help us you may rely upon our continued interest in making the journal an advocate of progressive photography. THE PUBLISHERS.

EDITORIAL NOTES.

THE ATLANTA CAMERA CLUB had an exhibit at the Piedmont Exposition that created considerable interest in its work. Among the pictures of local interest was a view of the old Tan Yard branch, with shanties along the banks, and children playing on the bridge, which had many admirers. Another picture was of a view of the Technological School, with scrub trees all around it and houses and hills, and the blue mountains in the background—a scene full of interest to those who have been educated within its walls. Outside of Atlanta, along the creeks and red hills, among the pine trees and oaks, were a hundred familiar views. It was all natural, all picturesque, all beautiful. There was McPherson's monument, the city stockade, with its high, whitewashed fence and

prison-like surroundings, the road to Edgewood, Peachtree Creek, where the battle was fought, the factories at East Point, Oakland, and Westview, in their lonesome grandeur and beauty—all as natural as nature.

Mr. THEODORE H. LUDERS, of the Photographic Society of Philadelphia, proposes to use the vapors of ammonia instead of a solution of the alkali in the development of gelatine dry plates.

THE following officers of the Buffalo Camera Club have been elected for the ensuing year: *President*, Dr. G. F. Hunter Bartlett; *Vice-President*, Charles W. Hamlin; *Treasurer*, Charles E. Hayes; *Recording Secretary*, George J. Bailey; *Corresponding Secretary*, E. F. Hall; *Directors*, Dr. Bernard Barton, Thomas Cary Welch, Edwin L. Burdick, George R. Howard.

WE are indebted to Professor F. H. Bigelow, of the Smithsonian Institution, Washington, for a handsome report on "The Solar Corona Discussed by Spherical Harmonics." It is a learned and interesting report and would interest many of our astronomical friends. We thank Professor Bigelow for his kind thought.

LORD RAYLEIGH, of the Oxford University, England, has been experimenting on pin-hole photographs. He says that the image is as fine as that obtained by the best lens, provided the length of focus is sufficient. If the line of the focus is too short, the opening of the hole becomes smaller than the pupil of the eye under the same circumstances, and then the sharpness of the image is not satisfactory. In his recent experiments Lord Rayleigh operated with a hole having one-sixteenth of an inch and a focal length of 9 feet. The results were excellent. If the opening of the hole is equal to that of the pupil of the eye, the length of the focus should be about 66 feet. Then the image obtained is as sharp as that formed on the retina of the eye.

WE are indebted to Professor A. L. Colton, of the University of Michigan, for a number of prints of thin sections of wood. Some of these are white and some are red pine, and Professor Colton says of them: "I think they will be sufficient to disprove the theory, mentioned in the BULLETIN of October 26th, that thin sheets of pine will transmit a non-actinic light suitable for the dark room. Each sheet was fastened in turn over an aperture in the north side of the house, and, with this exception, the room was thoroughly darkened. The camera was set up in the room at such a distance from the sections as to reproduce their dimensions in the photograph. Each exposure was made in thirty-six seconds on a Seed twenty-three plate, using a rectilinear lens, stop $f/64$."

WE thank Professor Colton for calling our attention to these prints, as they are extremely interesting. Nevertheless we would call his attention to the fact that we simply noted a report in these columns, it being stated that thin sheets of wood could be used instead of ruby glass in the dark room. It is, of course, important that the sheets should not be too thin; and again, what may be good for gaslight would not prove suitable if used with daylight.

SULPHATE of quinine is recommended as an addition to paste, glue, gum arabic, and such materials, to prevent mould fungi from forming in them. One part in one thousand is said to be sufficient for the purpose.

M. J. GREEN, of London, England, uses the electric light for making portraits, and proceeds as follows: He replaces the oiled silk used for a screen by a series of tubes of glass, parallel and vertical and in contact. He found this method to give speed and best results; and if necessary the tubes can be filled with colored solutions if varying results are desired. The tube screen is placed immediately in front of the electric light.

On a recent visit to the maritime exhibition held in Boston, we were forcibly struck by the comparative absence of matters and things nautical.

There were, to be sure, many models of vessels, naval relics, etc., and much of a strictly maritime nature of great interest; but there was, as well, so much of the element so often found at our technical exhibitions in the way of international popped corn, Franco-American confectionery, Turco-American knick-knacks and fancy goods, entirely foreign to the nature and intent of the undertaking which fosters it, that the observer cannot but feel that the standard of the exhibition suffers deadly harm from the intrusion. The art department contains some fine examples of marine photography by Stebbins, of Boston, and Mr. H. G. Peabody shows upon the main floor a number of excellent silver prints and enlargements from his well-known coast views, surf studies and marine compositions.

THE new cruisers, in their visit to Boston, afforded very strong temptations to the amateur photographer, and if one might judge by the many specimens to be found hovering about the docks and ferries, and pulling to and from the trim white cruisers, carrying all kinds of cameras, from the detective to 8 x 10 and larger, he might conclude that the entire fleet would be taken many times before it started on its long cruise around the world.

[By our Special Correspondent.]

ENGLISH NOTES.

THE out-door season is over, the camera has been put into its case and stowed away in a cupboard; for the fogs of November are upon us, and the leaden skies of an English winter will dull the energies of the photographer for some months to come.

But fortunately there is plenty of work to be done in-doors, so that photography can fairly be styled an "all the year round" pastime or profession. It is now that we begin carefully to review our negatives, and select those which are thin and full of detail for enlargement upon bromide paper. From all the passable ones we prepare lantern slides, for a good photograph is never seen to such advantage as when displayed upon a good opaque 12 or 15 feet square screen, by the help of the lime-light. We have now time, too, to retouch, "dodge" and improve our negatives. The backs of some we cover with ground glass varnish (containing a little iodine, if necessary, to give it a yellow tint), and we pick out the varnish with a pen-knife from those parts which are too dense.

Printing is now rather slow work, but the platinotype process is coming into universal use, and it yields prints with about half the exposure required for a silver print; or we employ bromide paper, and develop the image which results

from a few seconds' exposure to gaslight. I consider that silver printing is really doomed at last. It is recognized that a silver print has but little chance at our exhibitions, and the windows of all our best professionals are full of fine work done in platinum.

Thank goodness, one of the great reproaches of photography is being wiped away, and our descendants will be able to see something of what we have achieved. Of the countless number of photographic negatives, positives and prints made between 1839 and, say, 1886, how many, and what percentage are still in perfect condition? The answer would be a melancholy one; but *nous avons changé tout cela*.

Now, too, is the time to lay our plans for the season of 1890. And let me recommend every photographer to lay out some definite line of work or research and stick to it. Photographic societies should especially consider whether they cannot lay down some line of action which shall find united and useful work for their members, and advance their cause in the public mind. As an example I may note that Mr. W. Jerome Harrison has just laid before the Birmingham Photographic Society a scheme for the photographic survey of Warwickshire, one of the most charming of our English counties. He points out that only now has such a scheme become possible. The magnificent government map, on the scale of 6 inches to a mile, now just completed, shows the outline of every field and the position of every tree. Warwickshire is comprised in two hundred sheets of this map. It is proposed to allot one sheet of this map to each pair of photographers who are willing to share in the enterprise. It will be their duty to obtain good negatives of every point of interest within the areas allotted to them. The panoramic views, rural scenery, old castles and manor houses, quaint cottages, quainter inhabitants; the manners, customs and dress of the people; the rock sections in quarries, railway cuttings, cliffs, etc.; the famous trees and rare native plants; all the objects of historical, antiquarian and scientific interest—in short, everything illustrating the state of things as it exists to-day in this lovely district in Central England, the birthplace of Shakespeare and of "George Eliot," is to be recorded on our sensitive dry plates and printed in platinum for the edification of our descendants. The size of picture recommended is "whole-plate," ($8\frac{1}{2} \times 6\frac{1}{2}$ inches), but pictures of other sizes may be bound up in special albums. Several complete sets of views will be prepared for the public reference libraries, and a set of specially selected prints will perhaps be issued quarterly to subscribers.

Such a work may be considered as an extension of that which has already given us in America "Old Boston," and in England "The Hundred of Wirral," a part of Cheshire. It seems to me that it is the duty of every photographic society to attempt to secure a faithful and accurate record of the state of things now existing in its neighborhood. How invaluable should we consider such records of the past if they now existed! And it is a duty we owe to posterity to transmit to them what we so earnestly desire, but desire, alas! in vain.

I have lately been using some of the "Climax" celluloid films, manufactured by Messrs. Anthony, and I am free to own that for out-of-door work I am at last converted from glass. The rigidity (for so thin a film), combined with wonderful transparency and the excellence of the emulsion, somewhat surprise me. Those who have used similar films have complained—and I have seen the proofs—of numerous spots and other defects, but I find the "Climax" films absolutely

faultless in this respect. I have tried them chiefly for portraits, and I get (it may be by chance, but certainly it is the fact) a roundness of modelling which I never secured on glass. I never thought to see a completely successful substitute for glass, but I must own that it has at last been obtained.

Most people would scout the idea of successful detective camera work in an English November. Taking advantage, however, of a fine day early in the month, I sallied forth into the streets of a large town and secured "scenes of every-day life," which gave me much pleasure. Perhaps part of the secret was I used isochromatic plates. Under ordinary conditions, good light, etc., I find little advantage in the use of such plates, but on dull, "yellow" days they are far in advance of other plates, as indeed we should expect them to be, from their superior sensitiveness to yellow light.

How many silver prints have to be thrown away through want of care while printing, the result being that the prints are overdone, and look "scorched" or "black as my hat!" I find the following method, which is due to a Scotchman, Mr. Donald, to be valuable in such cases. After the too-dark prints have been toned, fixed and dried, they are placed in fresh hypo of the usual strength, to which a little methylated spirit has been added. Here they will soon be seen to suffer a slight reduction, when they should be transferred to a saturated solution of common salt. After a sojourn of five minutes in the salt, put the prints back into the hypo again, and then wash and dry. If the prints are extremely black and overprinted, about five drops of a saturated solution of potassium cyanide should be added to the salt bath. The process can be repeated if the first reduction is insufficient.

The chief photographic exhibition of our year—that held in Pall Mall, London, by the Photographic Society of Great Britain—closed on November 13th, after having been open to the public for six weeks. In addition to the members and their friends, the exhibition was visited by 12,600 of the general public, and the sum of \$1,700 was taken at the doors. No previous exhibition contained so few "poor" pictures, the general level of merit being very high. Most of the pictures were in platinotype, and it seems probable that in a few more years the silver print—for exhibition purposes at all events—will be as extinct as the dodo. That such may be the case (for photography will thereby be largely freed from its great reproach, want of permanency) is the sincere wish of

TALBOT ARCHER.

EIKONOGEN AND PYROGALLOL, WITH REMARKS ON THE COMPARISON OF DEVELOPERS.*

BY ROMYN HITCHCOCK.

It is not unfrequently that we read of the special merits of a particular combination of alkali and pyrogallol, with certain other more or less inactive ingredients, for developing dry plates. We are also told from time to time that a certain kind of developer is best for one brand of plates and another kind for a different brand. If we regard the formulas given by the plate-makers themselves, it would seem that many of the latter have taxed their brains most seriously to invent some new thing in developers, and the results are occasionally most surprising. These various mixtures show very clearly that almost any concoction of compounds will develop a picture if the proper proportions of pyrogallol and alkali are present. In a recent leader in the *British Journal of Photography* I

* Read before the Chemical Society of Washington, November 14, 1889.

find the following statement : " Photographers well know that the best developer for one plate may be the very worst for another." I doubt if photographers know any such thing, within the limits of a reasonable application of the statement. No one would advise an ordinary negative developer for a transparency plate, for example, although it would not prove fatal to excellent results if the exposure were made accordingly. The obvious meaning of the writer is that the best developer for negatives, with one ordinary commercial plate, may be the worst for another, and this is the statement I propose to briefly consider.

The developer is made up essentially of alkali and pyrogallol. No other constituent is necessary for any plate whatever.

The statement has been frequently made that a bromide is absolutely necessary. My experience has been that any commercial plate can be developed without a bromide, and, in fact, my practice is to work without bromide until the course of development shows it to be necessary, which is not often the case.

The other constituents which are added to developers need not be here considered. The only important one is sodium sulphite, which, though it has an influence on the development, is not added for that reason, but only to keep the solutions and plates clear and free from color.

Confining our attention, then, to alkali and pyrogallol, we recognize the fact that certain relative proportions of these two constituents will best develop a properly exposed plate. Every operator has his favorite developer, and perhaps also his favorite plate ; hence I prefer not to designate any particular formula or brand, but we will suppose that each person makes good pictures. Now, are there any differences in plates such as would require these modifications of the developer? The principal differences are in the sensitiveness, the character of the gelatin and the presence or absence of iodide. None of these differences indicate the need of material changes in the developer, and it is undoubtedly a fact that, with the right exposures, the same developer will serve equally well for all plates. But the correct exposure for each kind of plate must be learned by experiment, and it must not be forgotten that the correct time of exposure depends upon the developer as well as upon the plate.

I do not advocate the use of one form of developer for all plates, for it is convenient to modify the proportions to suit one's method of work. Some plates tend to give hard negatives, and unless full exposures are given a more energetic developer is necessary to get satisfactory negatives with such plates. But the fact remains that, if the exposure is properly judged, one developer will suit all bromide plates, and the only satisfactory method of comparing plates with each other is to adopt a standard developer for them all, particularly as regards the proportion of alkali.

The duration of the development has been considered as indicating the character of the exposure. But such indications are likely to be very misleading when different brands of plates are to be compared. The character of the gelatin—its permeability to the solutions, or otherwise—affects the time of development. Then, again, the character of the subject greatly influences the time required to bring out the first appearance of an image. How very often an image comes slowly into view on a woefully over-timed plate. This is a matter seemingly dependent upon the character of the light coming from the object. An energetic light action leads to prompt and strong development. Weak light gives weak and slow development.

It is, therefore, obvious that time of development is not an element to be considered in comparing plates. The development of each plate must be continued until sufficient density is obtained and the character of the images then compared.

Thus far we have considered only the matter of developers made with pyrogallol and alkali. Other reducing agents are in use, and it becomes a matter of importance to know how they compare with pyrogallol in their action on the invisible image. The latest developing agent is eikonogen, which has been very highly recommended; but we look in vain for any comparative tests of this substance and the well-known pyrogallol from which one may judge of their relative efficiency as developers. Indeed, we have not adopted any rational method of comparing developing agents.

In the common alkaline developer it is known that the pyrogallol effects the reduction while the alkali accelerates the reaction. The addition of more alkali increases the reducing action even to causing a general fog on the plate. The use of an excess of alkali, such as is occasionally necessary for under timed plates, is objectionable because it tends to soften the film as well as to produce stained plates. It would, therefore, be a great boon if a developing agent could be found which would act more energetically than pyrogallol with a smaller proportion of alkali.

Tests of developing agents should be made with reference to the amount of alkali required to develop the picture, and the one that gives a picture with the smallest quantity of alkali is likely to prove the best. But it is a mistake to suppose that the stronger agent will give a better picture than the other. Compare, for example, quinol and pyrogallol. The latter is certainly the more energetic, as it requires less alkali, but one gives as excellent a picture as the other. I speak now of the development alone, without regard to color of the deposit or staining of the film. Moreover, by exposing the plate a little longer for hydrochinon than for pyrogallol development, the same strength of alkali will serve equally well for both.

The importance of an energetic reducing agent for development is felt when we come to develop instantaneous exposures. I mean by this not ordinary shutter exposures, but pictures made with extremely short exposures—as, for example, such as are required to give sharp definition of a trotting or galloping horse. When we use pyrogallol the alkali must be strong, and to bring out all the detail without strong contrasts the pyrogallol must be used sparingly at first. The development requires to be forced, and yet it must proceed slowly. There is risk of softening the film before the deposit is dense enough, and we may get fog. If a more energetic developing agent than pyrogallol could be found we would be able to bring out the details with a smaller proportion of alkali, and plates would be apparently more sensitive.

In order to make a just comparison of the developing power of eikonogen and pyrogallol, it was first necessary to determine how much of the new agent should be used in a given quantity of developer in order to develop a properly exposed negative. The density of a negative depends more upon the proportion of the reducing agent than upon any other constituent of the developer. In the case of pyrogallol, we know that 100 c.c. of the developer should contain about 0.5 gram of the solid compound. I have found that about three times that quantity of eikonogen gives excellent negatives, perhaps slightly stronger than the pyrogallol, but this proportion is about right.

It is also necessary to have exactly the same quantity of alkali in the eikonogen and pyrogallol developers, otherwise the comparison would be unfair. The composition of sodium sulphite, however, is very uncertain. One writer has sagely informed us that eikonogen mixed with sodium sulphite, without the addition of any alkali, will develop a picture. It certainly ought to, for the ordinary sulphite contains alkali enough for the purpose. The simplest way to overcome the uncertainty as to the composition of the sulphite seemed to be to add exactly the same quantity of a saturated solution to each developer.

The solutions were therefore made as follows:

P.

Pyrogallol.....	2 grams.
Saturated solution sodium sulphite.....	50 c.c.
Water to make.....	300 c.c.
100 c.c. = 0.66 grams pyrogallol.	

E.

Eikonogen.....	6 grams.
Saturated solution sodium sulphite.....	50 c.c.
Water to make.....	300 c.c.
100 c.c. = 0.20 grams eikonogen.	

A.

Potassium carbonate, dry.....	20 grams.
Water to make.....	200 c.c.

As thus prepared, the pyrogallol is at first quite colorless, but gradually it takes a slight tinge of brown. The eikonogen solution is of a grass-green color. I tried to use sulphite made by saturating a solution of sodic carbonate with sulphurous acid, but I found that the eikonogen would not dissolve, as it is precipitated by acids. This is why the manufacturer is particular to state that the sulphite must not be acidified.

Mixing three parts of P or E with one part of A gives developers containing in each 100 c.c.

Pyrogallol.....	0.5 gram.
or	
Eikonogen.....	1.5 "
Alkali K_2CO_3	2.5 "

This is the proportion I recommend for both developers,* and it is the proportion used in the experiments described below, unless otherwise stated.

To compare these developers, the following experiments were made:

1. A plate was exposed on a suitable object, then cut across vertically and the two halves developed together in the two developers. The utmost care was taken to treat the two pieces exactly alike. They were put into the developers and taken out together, washed under two taps, transferred to the same alum and acid bath, again washed and fixed.

These pieces are marked P_1 and E_1 . You will observe that the eikonogen-developed negative is of good printing quality while the other is weak.

2. The next plate was also cut and developed in the same manner, except that the development was carried on until the pyrogallol picture was quite

*The reader who is not familiar with the metric system need not be troubled with any reduction of grams to grains, but in every case where the metric system is used, simply read *parts* instead of grams and cubic centimetres. Thus solution P is composed of two parts of pyrogallol, fifty of sulphite, and about two hundred and fifty of water, and these *parts* may be grains, grams, ounces or pounds. A gram is about 15 grains, and an ounce is about 30 c.c.

strong. The pieces P_2 and E_2 show that the eikonogen development is much too dense, while the other is about right.

These two experiments show, therefore, that with the same quantity of alkali and the proportions of pyrogallol and eikonogen given above, the eikonogen gives the strongest negative in the same time of development.

3. In order to get the two halves of a plate of about equal density, another plate was cut in the manner above described, and the eikonogen developer used on plate two was employed again in this experiment. The pyrogallol developer was freshly mixed, and to hasten its action 60 c.c. of P was mixed with 25 c.c. of A. The two pieces were developed together as before, for the same length of time, and the resulting pictures were as near the same density as could be desired.

Thus far we have only spoken of the density of the image; but there are other important qualities to be considered. The first of these is color, which materially affects the time of printing. If you could see these negatives by daylight you would observe that eikonogen gives a fine blue-black tone, which is conducive to rapid printing, while the pyrogallol all have a characteristic slightly yellowish color, which materially increases the time of printing. These negatives, however, are not stained by forced development. They are perfectly fair examples of pyrogallol development. The alum and acid bath was used in order to get the negatives as free from color as possible.

To show the printing qualities of these different negatives, the halves were joined together in printing frames and equally exposed to light. The resulting prints speak for themselves.* It is perfectly clear that there is a very great advantage in the use of eikonogen because of the time saved in printing.

It is clear from these experiments that eikonogen is a stronger developer than pyrogallol when used in the proportions given above. But it becomes of importance to know whether these proportions are the best. Another comparison was therefore made, using the pyrogallol mixed as before, but taking half the quantity of eikonogen solution and diluting it with its own volume of water.

The qualities actually used were:

(1) P.....	60 c.c.
A.....	20 c.c.
E.....	30 c.c.
(2) Water.....	30 c.c.
A.....	20 c.c.

A well-exposed plate was cut in two as before, and the halves developed side by side in the two mixtures. The pictures came up together very quickly and rapidly increased in strength, the portion developed in pyrogallol evidently somewhat denser than the other. Both were placed under the taps at the same moment, passed through the alum bath and fixed. The pyrogallol negative was the stronger—rather over-developed indeed—but the eikonogen negative was of excellent printing quality.

This experiment shows that a proportion of 0.5 gram of pyrogallol or 0.75 gram of eikonogen to each 100 c.c. of developer, using the same quantity of alkali, gives a stronger development in a given time with the pyrogallol, but nevertheless a very excellent but somewhat slower development with the new agent.

* The prints sent corroborate Professor Hitchcock's statements.—Eds.

The results of the experiment are shown in the prints P_4 and E_4 . Perhaps it is well to mention that the stock solutions had been standing a fortnight when this last experiment was made. The eikonogen was of a fine grass-green color.

Although the weight of eikonogen required for development is so much more than that of pyrogallol, and although the cost of the former is at present \$1.46 per 100 grams, which is about the same as the cost of pyrogallol by the ounce, the actual difference in the cost of development is not so considerable, for the reason that while the alkaline pyrogallol solution rapidly turns red and deteriorates, the eikonogen solution can be used repeatedly, the small quantity of sulphite in the formula above given being quite sufficient to preserve the color.

After developing a single plate, the pyrogallol is distinctly red, and the color deepens on standing. The eikonogen, however, only shows a green color, which does not appreciably change in a couple of days, and I have used the developer after standing two days in a warm room with perfect success.

Eikonogen is to be recommended also because the plates developed by it do not become stained. The manufacturer says the alum bath must not be omitted. Not knowing why, I forthwith omitted the alum bath, and I am as much in the dark concerning the reason for its use as ever. It is perhaps a wise precaution to wash the negatives thoroughly to remove the developer completely before putting them in the alum bath, because the eikonogen left in the film will be precipitated by the acid, and probably remain there to the possible detriment of the negative in future.

To sum up the results of these experiments, I have found :

1. That eikonogen, used in the proportion of 1.5 gram to 100 c.c. of developer, yields stronger negatives with a given quantity of alkali than pyrogallol used in the proportion of 0.5 gram to 100 c.c.
2. That when the above proportion of eikonogen is reduced over one-half, using the same quantity of alkali, the density is not quite equal to that given by the pyrogallol.
3. There is no difficulty in obtaining any desired density with eikonogen. The tendency is toward softness and delicacy, with apparently a very fine grain in the negatives. There is no danger of stain.
4. Eikonogen negatives print very much quicker than pyrogallol negatives of apparently the same density.
5. Eikonogen makes a cheaper developer than pyrogallol, because the mixed developer can be repeatedly used.

U. S. NATIONAL MUSEUM, Washington, D. C., November 6, 1889.

WIDE-ANGLE LENSES.

DEAR BULLETIN:

I promised to write you more on the subject of lenses, and desire to make good my promise, but having misplaced my BULLETINS and forgotten just where I left off, I am in a quandary. The best way will be to close my eyes, grope over my shelf and select the first lens I come across. I do so, and it happens to be a wide angle rectilinear. Therefore I will expatiate on it. For interiors, I find it a most useful one, as I can photograph the entire end of an ordinary room and part of each side, although I confess a preference for including very little of one side, the end, and as much of the other side as the angle will admit, and

this with all the possibilities of the lens on the plate. When an interior is photographed by use of a lens of the rapid rectilinear order, the angle included is so small or narrow that it fails to give any correct idea of the room, and it would require eight negatives to go all around, where four will answer with my wide angle. I was told the other day that the wide angle lens "distorted so much as to render it worthless." Well, it may do so, but does not such depend somewhat on the angle? I remember seeing a picture made of Stewart's up-town store in your city, by Mr. Roche (who, by the way, is connected with your publisher's house), and it looked like a white wedge with pock-marks in it. The marks were windows, but the shape a case of awful distortion. I asked what lenses the picture was made with, and was told they were Busch pantoscopes. Now, such a lens may be of use to some, but I cannot see where it would be of slightest value to an amateur. I consider that mine gives me about 90 degrees angle on the diagonal of my plate, and this is bad enough. I never use it except for interiors. I tried an outdoor view with it of a house that stood in such a position that I could not take it with my rapid rectilinear. The house itself was all right, but the minute you examined the surroundings, they were fearful. There being no front fence, the rear fence was shown in the view, and it looked as if it were 100 yards away from the front, and all the out-buildings looked half a day's journey away. In an interior with same lens, I admit that it makes my somewhat circumscribed rooms look much larger and longer than they are, but, upon examination, the distance grows gradual and the lines being perfect, one can readily see that a chair, for instance, in the end of the room is as large as one in the foreground, but, being farther distant, appears smaller; but no stretch of the imagination can bring that barn in my landscape to appear like anything more than an exaggerated hencoop, and the famous cattle to look like diminutive calves. In fact, the little child in the foreground is larger than her father, a portly man, but who stands not very far to the rear of the child.

Now try this experiment, or, if you have no time, get one of your readers to try it. With a lens of, say, 20 inches focus, make a certain view on a 10 x 8 plate. Next, walk up nearer until with your wide-angle lens you include the same subject on your plate, taking the horizon as your measure. Examine prints from the same negatives and see the difference. You will find, that, placed about 20 inches from the eye, the one made with the narrow-angled lens stands out full and complete, and can be grasped by the eye entire, while the other must be examined in sections, and cannot be comprehended by the eye from one point. Now, make lantern slides from these same negatives and show them on the screen. The same difference will apply, and where the projecting lens will show one picture clear and sharp all over, it is necessary to adjust the focus of the lens to suit the different parts of the view made with the wide-angle lens. There seems to be a kind of wide-angled cussedness that follows it wherever you place it. In my collection of lantern slides I have some that will show much more sharply than others at the margin, the centers being equally sharp. I can readily imagine the lenses used in making the originals from results given with my own. Now, one word about diaphragms. In making interiors, it is desirable to get all the details possible and therefore plenty of exposure. Having found the proper focus by use of the largest diaphragm, make the exposure with the smallest one, and crowd on the time, if no windows or strong reflections show. If these appear, shade them all you can by curtains, closing them effectually

for duration of exposure, then open and expose again for two to five seconds, just long enough to get the required detail, but not long enough to give that abominable enemy to a good result, Halation. The making of a good interior is as difficult as the posing of a subject under the skylight, with every advantage of curtains, screens and reflectors that can be desired. It must be strong, brilliant, full of detail, and not show halation. It was a long matter of study to photograph properly a silver vase or pitcher. It is done to perfection by placing a lump of ice within it. This causes a condensation on the outer surface, that, while it gives every detail, prevents the strong reflections from its polished surface that rendered futile all photographic art to depict its beauties.

Now that outdoor photography is about closed for the current year, let us have some experiments on in-door work, and competitions that will give incentive to finest results in our houses. Photograph your houses from top to bottom inside and put a complete set of prints in your iron safe. If burned out, you can readily make out a bill against the insurance company, and forget nothing.

ABE LIZZARD.

CHEMISTRY OF CHROMIUM AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

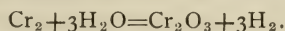
BY P. C. DUCHOCHOIS.

CHROMIUM, Cr.

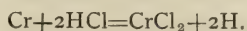
This metal is important on account of its combinations, which are extensively employed in the arts and manufactures.

It is grayish white, non-magnetic, very brittle, difficult to melt, and exceedingly hard ; it scratches glass like corundum.

It is not oxidizable in the air, and does not decompose water even at the boiling temperature. At redness it absorbs oxygen and decomposes steam, being converted into chromic oxide.



Its cohesion is so great when obtained by the reduction of chromic acid, intimately mixed with charcoal and submitted in a covered crucible to the most intense heat of furnaces, that it is almost unattackable by acids, except, however, hydrochloric acid, which converts it into chromous chloride with liberation of hydrogen.

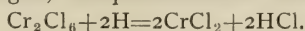


Chromium obtained by the reduction of chromic chloride by sodium occurs as a gray powder, easily attacked by acids, and taking fire when heated in the air.

The salts of chromium are poisonous. Antidotes are uncertain ; chalk or magnesia diffused in water or milk, ferrous sulphate with soda.

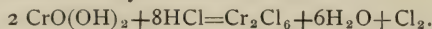
COMBINATIONS OF CHROMIUM WITH THE HALOIDS.

Chromous chloride, chromium dichloride, CrCl_2 , is prepared by reducing chromic chloride by hydrogen, in a porcelain tube heated to redness :



Chromous chloride is white, soluble in water with evolution of heat. Its solution is blue and absorbs oxygen from the air more rapidly even than either ferrous or stannous chloride, being tinged green from formation of an oxychloride, $\text{Cr}_2\text{Cl}_4\text{O}$. It is therefore an energetic deoxidizing agent.

Chromic chloride, chromium sesquichloride, Cr_2Cl_6 . The anhydrous compound is obtained by heating to redness in a porcelain tube a calcined mixture of chromium oxide and charcoal, over which a current of chlorine is passed. It crystallizes in the cold part of the tube in large plates of a peach blossom color. It is insoluble in cold or boiling water, but an infinitesimal quantity of chromous chloride added to water determines its solution. By evaporation the solution deposits green needles of hydrated chromic chloride soluble in water. This hydrate can be obtained by dissolving chromic hydrate in hydrochloric acid, or by treating chromic acid with hydrochloric acid :



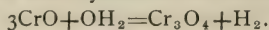
The combinations of bromine with chromium have not been well studied. Those of iodine are unknown.

COMBINATIONS OF CHROMIUM WITH OXYGEN.

Chromium forms the following compounds with oxygen:

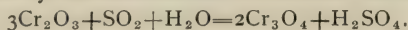
Chromous oxide or chromium monoxide.....	CrO
Chromic oxide or chromium sesquioxide.....	Cr_2O_3
Chromic anhydride or chromium trioxide.....	CrO_3
Chromic acid.....	CrO_3OH_2

Chromous oxide, CrO , is known only in combination. When precipitated from its salts it rapidly decomposes water, unites with the oxygen, liberating the hydrogen and is transformed into hydrated chromous chromate:



This compound, Cr_3O_4 or CrOCr_2O_3 , is brown, unstable and when heated in the air absorbs oxygen, being transformed into chromic oxide.

It can be obtained by the deoxidation of the latter oxide by sulphur dioxide:

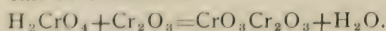


Chromous oxide forms blue salts which are unstable, absorbing oxygen quite rapidly.

Chromic oxide, Cr_2O_3 . The anhydrous oxide is easily obtained by heating ammonium chromate which is decomposed with incandescence and leaves the compound in question as a residue.

Anhydrous chromic oxide is deep green, stable in the air, not decomposed by heat and hydrogen, insoluble in water and in the alkalies, soluble in acids when it has not been calcined, otherwise dissolving with difficulty. Heated in the air with potassa and soda it oxidizes and forms chromates. Glass and borax dissolve it under the influence of heat, being colored green.

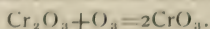
The hydrate is prepared by the precipitation of a chromic salt by potassa. The precipitate dried over sulphuric acid contains six molecules of water, $\text{Cr}_2\text{O}_3 \cdot 6\text{H}_2\text{O}$. It is soluble in the alkalies, not in ammonium hydrate, and unites with chromic acid, forming chromic chromate, from which by prolonged washing chromic acid can be extracted:



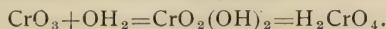
Several hydrates of chromic oxide are known, yielding violet, blue, green or red salts. According to Berzelius they are isomeric.

The chromic compounds are isomorphous with those of ferric oxide, Fe_2O_3 .

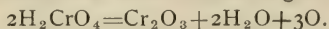
Chromic anhydride, CrO_3 . Chromic oxide strongly heated in the air absorbs oxygen and is thus transformed into chromium trioxide:



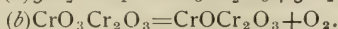
This oxide is deliquescent, soluble in concentrated sulphuric acid without decomposition. With water it forms chromic acid:



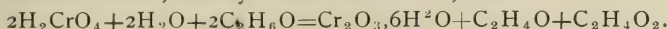
Chromic acid, H_2CrO_4 , crystallizes in beautiful octahedra of a yellow red color. It cannot be deprived of the elements of water, for it is decomposed into chromic oxide at the temperature at which water is given off:



In presence of organic matter it is decomposed by light into chromic chromate, then into chromous chromate:

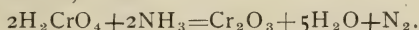


Its alcoholic solution is decomposed by heat or by light, giving rise to hydrated chromic oxide, aldehyde and acetic acid; thus:

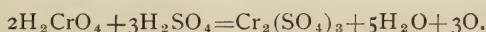


Absolute alcohol dropped on crystals of chromic acid inflames at once, and the acid in being reduced to chromic oxide becomes incandescent.

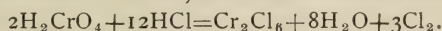
Chromic acid is also reduced to Cr_2O_3 , with evolution of light in an atmosphere of gaseous ammonia; thus:



Sulphuric acid under the action of heat transforms it into chromic sulphate:



Sulphur dioxide acts in a similar manner. Hydrochloric acid transforms it by ebullition into chromic chloride, and chlorine is evolved:



Organic substances, paper, starch, sugar, gelatine, albumen reduce it even in the dark.

Chromic acid and potassium dichromate coagulate albumen. In photographic preparations the coagulation is prevented by adding aqueous ammonia in excess. The reason is obvious.

Chromic acid tinges silk, wool, and quills yellow. Its action on the skin produces diseases which become chronic and tedious to cure. It is exceedingly toxic.

(To be continued.)

DECEMBER WORK FOR THE AMATEUR.

BY W. E. PARTRIDGE.

WITH the falling leaves many amateur photographers consider the season's work closed, and lay aside the camera until the snow-storms of winter tempt them. This custom is greatly to be regretted. Between the time of the falling leaves and the snow scenes of the winter there is nearly a month of charming landscape effects which can be found at no other season of the year.

During the months of November and December the sun is low, and long and striking shadows can be found at almost any hour of the day while the sun is shining. The light is soft and weak, and the landscape masses itself as in an early summer morning. Those who insist upon using fast plates under all circumstances can make time exposures at this season and still obtain plucky negatives. For those who will use a slow landscape plate the season is all that can be desired. There are many hours on every sunshiny day when the wind

does not stir the smallest twig. The length of exposure is practically unlimited. Nor is there the least danger of losing the smallest detail.

There are many days when it is as pleasant to be in the woods as it is in the month of May. The waters retain a comparatively high temperature long after the first frosts. Until the ground actually freezes, its temperature is much higher than in the early spring. Indeed, there is less danger of taking cold on an excursion in December than in the first half of May.

All this being granted, then comes the question, What is there to take? This is pertinent. Fortunately, the answer is easily given. First, there are landscapes where the tree portraits form the leading feature of the picture. These landscapes may be made full of sunshine—so full, indeed, that the photographs will seem to glow with the glory of the autumn sun. Then there are woodland slopes with the tree shadows crossing them, rocky forest knolls, brooks in the deep dells, and, lastly, tree portraits. Brooks can be taken at this season of the year with far better results than in the summer.

Most amateurs in the vicinity of New York would consider High and Washington Bridges decidedly *passé* themes for a photographer. But the country around the bridges has hardly been touched, even with the foliage on the trees. December is the month of all others that gives opportunities for compositions, and these are of a character which cannot be obtained at any other time in the year. From the southeast corner of the roadway around the reservoir and standpipe, there is a view looking out over the elevated railroad terminus which deserves to be called a picture. The best time for an exposure is early in the forenoon or after 1 P. M. The rocky banks of the river, which are hidden in summer by dense foliage, now stand out boldly. The rugged features of both shores show distinctly beneath the delicate tracery of the branches, while the trees themselves become striking and contrasting incidents. The whole valley of the Harlem takes on a new character, decidedly unlike its summer appearance, and very much more available for the photographer.

In the deep dells of the woodlands, where four or five minutes' exposure are required in bright July days, a negative may be made now in ten seconds, and now one is free from the annoyances of the breeze which makes the long exposure difficult and uncertain if there is much foliage to come into the picture. Where the trees are bare, the picture, of course, is very different, but it has features which make it equally interesting.

The abundance of water is one of the advantages which the fall and early winter have over any other season of the year. All the little rivulets have their banks full. The little streams of the summer are sturdy brooks or torrents. The woods are full of little lakes and ponds. There are water reflections in all sorts of odd places. Along the banks of these winter ponds, rocks, stumps and old trees make very attractive bits.

New Yorkers, who have time to make excursions into the woods of the 23d and 24th wards of the city, will find them full of very beautiful subjects. It is hardly possible to go astray on the west side above High Bridge. On the east side, above 170th street, any of the parks or wooded hills will amply repay a day's tramp. The new parks are practically just as nature made them. They cover vast stretches of woodland, and are easy of access.

In Massachusetts, December days in the woods are the most enjoyable of the whole year. The air is mildly intoxicating. The fallen leaves fill the woods

with a nutty flavor. The golden sunlight comes at a low angle, yet it gives an agreeable warmth to all the sheltered nooks and corners. The hum of the whole tribe of biting pests is still. Nature's work for the year is finished, and she seems gently resting and enjoying the fruit of her labors before her winter's sleep. Although we may not now reproduce the purple distance, the glory of the golden foreground, nor the infinitely tender blue above, our photographers can give the poetry of the days, and recall the charm which makes them so full of dreamy delight.

In 1876 the seven days following the 25th of December were the most beautiful of the whole year for out-door excursions. A party of city boys spent the week on the north shore, and wished that their vacations might always come after Christmas. The amateur, by taking advantage of each bright day, may prolong his season till the end of the year, and sometimes, indeed, carry it into January.

Autumn pictures are peculiarly attractive on account of the beauty of the bare trunks and branches. The individuality of the trunks and branches is seen, and the wonderful difference between trees of the same kind shown in a surprising manner. It is often difficult to believe that trees of the same kind can show such marked differences. The tracery of the branches against the sky, the shadows upon the trunks, and the bold markings of the bark, are not only beautiful in nature, but they are reproduced by the photograph in the most exquisite manner.

The amateur, in the forest at this season of the year, should be particularly happy, because he is independent of lenses and size of plate. There are numberless pictures which seem to have been composed expressly to come upon his size of plate and to fit the focus of his lens. There are subjects for the rapid rectilinear and the landscape, the portrait and the wide angle. There are plenty of bits to suit the 2 x 2, and it is just as easy to find subjects which were made for the 12 x 14. If the resulting negatives are not good and the prints good photographs and good compositions also, it will not be from lack of good material, ready at almost every step.

[From *Photographische Correspondenz*.]

PROFESSOR LUCKHARDT ON NEGATIVE RETOUCHING.

THE arrangement of the retouching desk is a matter of importance not to be overlooked, and it is well to construct it in such a way that the retoucher receives all the light through the negative. Besides a sufficient covering screen, extending beyond the head of the retoucher, a black background should be placed behind the latter, which will keep off all reflected light.

For the protection of the eyes, the retouching desk should also have a blue glass, of the same color as that used for spectacles, upon which the negative rests. A light-blue or light-green paper in place of the reflecting mirror might be sufficient, provided that with the aid of a revolving pane this could be so arranged that the negative can be brought into different positions. This would particularly facilitate cross hatching, no matter whether it is accomplished with the pencil or needle.

Aside from a certain knowledge of the anatomical relations which the negative retoucher is supposed to have acquired by previous lessons in drawing, and by visiting picture galleries, it is important that the beginner should not always

work on negatives, but from time to time should change off to positives, thus preserving a free sight and preventing one-sidedness.

To the many requests about information how to learn the art of retouching directed to me, I have always referred to a cultivation of taste, to be acquired only by a frequent observation of paintings and by diligent drawing from good originals.

It will be found of great advantage to place a mask with a circular opening over the negative, to facilitate the work and protect the eyes. The retoucher should always have a proof of the picture to be retouched at his disposition, to prevent wrong effects in modelling and defects in the form. A comparison of the retouched picture with the unretouched print admits always of infallible control by the retoucher.

For the beginner it is a very instructive exercise to work on a negative containing a scale of different tones, something like a photometer, where the retoucher has to harmonize the lighter tone with pencil and color in such a way that in the print it will act identical with the next higher tone grade.

This is an important point, as differences in the negative hardly observable by the eye, on account of the diversified transparency of the coloring matter or even of the pencil, for actinic light, will be of decided effect in the print. The greatest secret of retouching consists in the observation of correct proportions, and a knowledge of how far to proceed in the beautifying process on the subject. The characteristic form and the accidental or incorrect reproduction of the color value by the chemistry of the process, a yellow tint of the skin appearing here and there like a deepening of the form and injuring the modelling, should be recognized on a proof print.

The negative is generally varnished; sometimes it is only coated with a solution of gum, and if the varnish is not suitable for the pencil, the part to be retouched is rubbed with mattolein. This is not to be recommended, as the cleanliness of the negative suffers, and the silver of the paper adheres also, causing a change in the retouching. There is now negative varnish in the market which will receive the pencil very well without any extra preparation; if this is not the case, then I recommend finely powdered pumice stone or cuttle-fish bone for the parts to be rubbed. To protect the retouching, the negative may also receive a preliminary coating of ordinary amber varnish; on this surface the retouching is done, after which the plate receives another coat of alcohol varnish.

If the negative is to be worked with the etching needle, it should be done before the film becomes dry and brittle, or the varnish has to be made elastic by adding a little castor oil.

To the province of retouching belong also the efforts to produce optically at once a certain softness of form and an equalization of the complexion; for instance, by exposing—after sharp focusing—first, with full opening and applying during exposure a smaller diaphragm. Dinier, in St. Petersburg, is said to have set the air current before the objective in a tremulous motion with an alcohol flame.

The founder of modern Vienna photography, Ludwig Angerer, was known to be an enemy of retouching in any shape, not permitting any artistic improvement in the negatives or in the prints of his production. But the public decided differently very soon, and a celebrated competitor, who succeeded in giving the features of youth to a sixty-years old face, soon gained favor and became fashionable.

It is peculiar how changeable the taste is. At the recent Berlin exhibition, as well as in Paris, there were exhibited life-size heads, on which the retouching could hardly be recognized. True enough, they were mostly the portraits of men—*i. e.*, artistic portraits—but these very ones were greatly admired, particularly in artistic circles.

The coating of the glass side with mat varnish or colored collodion for the purpose of retouching is in many cases necessary for portraits as well as landscape negatives.

I personally have been using for many years collodion, colored with anilin red, but would call attention to the fact that August Leutner, for the same purpose, and by reason of its permanency in light, recommended lately an emulsion of the finest Berlin blue, which seems to be particularly suitable for negatives, from which a considerable number of prints are to be obtained.

The application of mat varnish colored with a few drops of tincture of iodine is also to be recommended. If colored collodion has been used on the high lights of a negative or light dresses, and this is removed from the respective places, after which they are flowed with mat varnish, and this is also correspondingly removed, a very even covering of the too transparent parts can be effected with fine tissue paper, thus causing an artistic distribution of light and giving fine effects.

Very important is the printing in of clouds in landscape, but care has to be taken that they harmonize with the general character of the picture. It would be ridiculous if the clouds received their light from the left while the landscape is illuminated from the opposite side, and still we find many such mistakes.

The method of reducing certain too dense parts of the negative with a wooden point wrapped in linen impregnated with alcohol, is particularly recommended for ortho-chromatic landscapes, where the leaves in the foreground appear frequently as if covered by snow.

On the remarkable portrait of J. B. Feitner, in Bremen, the clouds have been drawn with the stump in a layer of lampblack, a manner which certainly could find a successful application on landscapes. Attention might also be called to the effective improvement of a negative with the etching needle, a dot in the eye being oftentimes sufficient to increase the vivacity of the visual organ. It requires, of course, an artist to do this.

Difficulties arise sometimes with portraits in costume. These cannot always be taken with a landscape background, but require an interior ground suitable to the character of the picture. The light parts of such a ground have sometimes to be darkened, the perspective of the floor to be prolonged, disturbing ornaments must be removed and new ones have to take their place. All this can be done easily enough on a collodion plate, but into the gelatine film the fine needle penetrates only with difficulty, and it requires good practice. The grit thrown up by the needle is removed with a fine knife. By rubbing a cotton tuft soaked in alcohol over the etched lines the silver coating will to some extent be removed from the edges, which in the print will now assume a gradually darker appearance. All these corrections or changes have to be made before the varnish is applied.

It is not knowledge alone that is required, but practice—much practice.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

PHOTOGRAPHIC CHEMISTRY IN OUTLINE.

BY HUGH MARSHALL, B.S.C., F.R.S.E.

[Read before Edinburgh Photographic Society.]

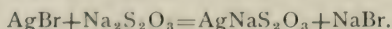
(Continued.)

THE other use of iron salts to which I will refer is the production of "cyanotypes." The first stage of the process depends on the action of light on organic ferric salts, already mentioned with reference to platinotype, and the second on the fact that potassium ferricyanide (red prussiate of potash) forms a *blue insoluble* compound with ferrous salts (Turnbull's blue), and a brown *soluble* one with ferric salts. Paper is coated with an organic ferric salt, preferably the double ammonium ferric citrate, dried and exposed under a negative. Wherever the light acts the ferric salt is reduced to ferrous, as with the oxalate in platinotype. When sufficiently exposed, the print is developed by a solution of ferricyanide, a blue image being formed where the light has acted, while the compound with the ferric salt, being soluble, dissolves in the solution. A rinse in water, to remove the soluble salts, completes the operation.

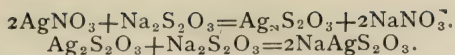
After development, negatives are generally treated with an alum bath. Here the gelatine undergoes a process of tanning, becoming tough and much better able to stand the after-treatment. It also stops incipient frilling by preventing the expansion of the film, which various reagents are apt to induce. Next comes the fixing, or removal of the unaltered silver haloid. Fox-Talbot used for the purpose a strong solution of common salt, in which silver chloride is soluble. In the wet plate process potassium cyanide was employed. This will dissolve any ordinary silver compound except the sulphide. The action depends on the formation of a soluble double cyanide.



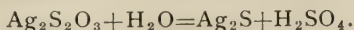
The use of this has several drawbacks. Even in not very strong solutions, metallic silver is attacked by the solution, so that fine detail might be lost. Then potassium cyanide is a very energetic poison, and accidents are liable to happen from its coming in contact with cut fingers. If any acid come in contact with it, we have evolution of hydrocyanic acid vapor (prussic acid) taking place, the inhalation of which might lead to disastrous results. Its place has now been taken almost entirely by a salt with a similar solvent action, but otherwise widely different properties, sodium thiosulphate (not thiosulphite), or, as it was formerly called, and is still by many, hyposulphite of soda, contracted to hypo. It is prepared in large quantities from the "tank waste" of the alkali manufacture. Its modern name is derived from its corresponding to sulphate of sodium with an atom of oxygen replaced by sulphur. Thiosulphates of the alkali metals dissolve silver salts with the formation of a double thiosulphate.



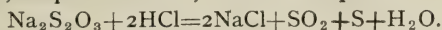
As the gelatine film tends to retain salts within it, very careful washing must follow the operation of fixing, for thiosulphates generally, and those metals like silver in particular, are very liable to decomposition. In the case of prints, this fixing and washing are more important than with negatives. In the former we may have some free silver nitrate which acts a little differently from the insoluble silver salts. The first action of the thiosulphate is to form silver thiosulphate, but if sufficient sodium salt is present, this is dissolved as double salt.



Should all this silver salt not be dissolved, it decomposes with formation of silver sulphide, which is black.



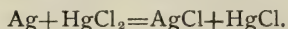
The free sulphuric acid thus produced would act on other thiosulphate, bringing about undesirable decompositions. It should always be remembered, then, to use plenty of thiosulphate, change the bath often, give plenty of time in it (the recommendation to use two, one after the other, is worth consideration), and wash *thoroughly*. "Hypo eliminators" are used by some, but I do not care about them. They act by oxidizing the thiosulphate to sulphate, which is harmless. But these substances as a rule are apt themselves to attack both the image and the film, and may do more harm than good. Before immersing in the fixing bath it is important to observe that plates or prints are free from acid, especially when an acid alum bath is used after development. Even very weak acids decompose thiosulphates, and the products are certainly not beneficial in any way. We have formed at first thiosulphuric acid, which very soon decomposes, forming water, sulphurous acid, and free sulphur.



Similarly it is important to remove all thiosulphate if an acid bath is used after fixing. Alkaline sulphites might also be used as fixing agents, as they also form soluble double salts with silver, thus :



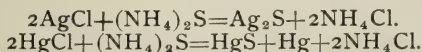
The photographer frequently finds he has produced a negative which is all right in every respect but one—the image is too thin to give good prints. It then becomes necessary to intensify. If possible, this process should be avoided. The results by any method yet discovered are rarely exactly what was desired, and often either the image or the film, or both, are deteriorated by the process. A perfect process would be one which increased the density strictly proportionally, which allowed the action to be stopped at any point, did not injure the film, and left the image as permanent as formerly. The intensification in most general use is that by means of mercuric salts—chloride or iodide. Mercuric chloride (corrosive sublimate) acts upon silver, forming silver chloride and mercurous chloride (calomel), both of which are white, but can be blackened by various means.



Ammonia acts on calomel to form a black compound,



and dissolves out the silver chloride. If mercuric iodide (dissolved in potassium iodide) be employed, then we get silver and mercurous iodides formed, and these may then be both blackened by Schlippe's salt (sodium sulphantimoniate). In this case the intensification is greater, as the silver compound remains in the film. The two chlorides can also be blackened by ammonium sulphide.



When blackened in this way the process can be repeated *ad lib.*, as mercuric sulphide (HgS) takes up corrosive sublimate, and the compound thus formed can be again blackened by ammonium sulphide.

There is another process, just the reverse of the preceding, which has occasionally to be employed—reduction of density of the image. This is still less

satisfactory than intensification, no trustworthy process being known. It consists in turning part of the image into a soluble silver compound and dissolving this out. Potassium ferricyanide is generally recommended for the purpose. This oxidizes the silver to oxide, and this is then removed by immersion in a hypo bath.

With regard to printing little more need be said, most of the important chemical points having been already touched upon. In silver printing by development, the actions are just the same as in the treatment of negatives. In print-out processes the actions are somewhat different. Here we have silver chloride with excess of silver nitrate in a film of albumen or gelatine, with which the silver nitrate appears to unite. The preparation is somewhat similar to the production of a wet plate in the case of albumenized paper. In the gelatine-chloride processes an emulsion is first made, and with this the paper is coated. In either case, on exposure to light we have apparently subchloride and suboxide formed. The resulting print is of a rather disagreeable color, and to get over this it is toned. This consists in coating the already formed image with, or replacing it by, some other substance. As a rule, this latter is metallic gold, but others, as platinum, uranium compounds, etc., are also used. According to the kind of bath used, we may have either the gold deposited on the image by a process somewhat analogous to the development of a wet plate, or we may have an equivalent quantity of silver removed, the gold replacing it in the image. In the former case we should expect increase in density, and in the latter loss of density, as for every two parts of gold deposited, more than three of silver would be removed. Finely divided gold is of a purplish color, and the blending of this with the color of the remaining silver image produces the resulting tone of the print. The color of the gold image itself varies with the nature of the solution from which it is deposited. It is generally stated that commercial chloride of gold as used for making toning solutions contains free acid. As a matter of fact, it is not really chloride of gold at all, but is itself an acid—chlorauric (HAuCl_4 , AuCl_3 being chloride of gold) uniting with bases to form the chloraurates, which are definite salts.

In conclusion, I would again state that this is but a very rough and incomplete sketch of the wide field embraced by the term photographic chemistry, and express a hope that, nevertheless, it may benefit some, if only to make them study a little more fully for themselves a subject of such importance and interest.

[From *British Journal of Photography*.]

PHOTO-MICROGRAPHY.*

BY ADOLPH SCHULTZ, F.R.S.E., F.R.M.S.

To explain to you the importance and advantage of the immersion system over the system of dry fronts, I must refer to one of the simplest and most important laws in optics, namely, that of the total internal reflection of a ray of light in a transparent medium, such as crown glass, when the angle of incidence exceeds 41° . Hence no cone of light greater than twice 41° , or 82° degrees, can pass from glass into air but by interpolating a medium of higher refractive power than air between the cover glass of an object mounted in balsam and the front lens of an objective. We not only enable rays of any degree of obliquity

* Continued from page 598.

to pass through the object into the objective, but the obliquity of these rays in the denser *media* than air—that is, in the immersion fluids—becomes less than before. In consequence of this refraction or contraction of the illuminating cone in the immersion fluid, rays of the greatest obliquity are enabled to enter the front lens and help to form the microscopical image, which rays, without the intervention of the immersion fluid, would be completely lost. Now it is obvious that the angular aperture of an immersion lens (measured in balsam) is equivalent to a far larger angle of an air lens. Professor Abbé, of Jena, has formulated an exceedingly simple expression, which enables us to compare the apertures of dry and immersion lenses, and he has called this the *numerical aperture*, viz.:

$$a = n, \sin u,$$

n standing for the refractive index of the immersion fluid, which is for air 1.00, for water 1.33, and for a homogeneous immersion fluid, such as cedarwood oil, 1.52, whilst $\sin u$ is the sine (a trigonometrical function) of the semi-angular aperture of the lens, $2u$ being the total angular aperture. The resolving power of an objective does not only depend upon its numerical aperture, but also upon the wave-length of the light used for illuminating the object. It is greater for monochromatic blue light, for the line F of the spectrum, than it is for white light, but it is greatest for the line h of the spectrum, or for that end of it where its actinic power dwells. A homogenous immersion objective of 180 degrees in oil is capable of resolving theoretically per inch—

146,543 lines by white light,

158,845 “ by blue light,

and 193,037 “ on the photographic plate.

Here we have in figures an expression of the far greater sensitiveness to light of the photographic plate than of the human eye. In other words, we may expect that a photo-micrographic negative may reveal to us one-fourth more than the human eye is capable of seeing in the microscope. The visibility of small isolated objects must not be confounded with the visibility of fine gratings, bands of lines, or other closely approximated structure, because only in these latter appear the phenomena of interference of the diffraction spectra produced by the passage of the light through narrow interstices. To render such structure visible in the microscope, or to resolve it, our objective must have sufficient aperture, so that at least one of the diffraction spectra of the first order is collected by it. This is not the place nor the time to enter into the theory of micro-objectives, but I must not omit to mention that medium and high powers, with the exception of homogeneous immersion lenses of some makers, are provided with an arrangement called a screw collar, which enables us to approximate or separate the front lens from the posterior combinations in order to neutralize the influence of different thicknesses of cover glass. So sensitive are fine wide-angled objectives, that a difference in the thickness of $\frac{1}{10000}$ inch of the little glass which covers the object may prejudicially affect the performance of the lens unless this difference can be neutralized by the adjustment of said screw collar. By far the best lenses for photo-micrography, as well as for every other purpose, are the new apochromatic lenses of Carl Zeiss in Jena, and also those of Powell and Lealand in London, which they make of the new optical Jena glasses. Several English and foreign opticians call their lenses also apochromatics, because they employ the new glasses for their objectives. The apochromatic lenses differ from the ordinary achromatic lenses, which are not strictly achromatic, as they are only corrected for two colors of the spectrum, by their being corrected for three colors, which render them practically quite achromatic. The chemical and visual foci of these new apochromatic lenses coincide, their definition and resolving power exceeds that of the ordinary achromatic lenses in consequence of the perfection of their corrections, they give a far greater amount of light and stand a far larger amplification by eye-piecing than the ordinary lenses, and are, therefore, in every respect the best objectives for photo-micrography and all other microscopical work. As no good music can be got out of inferior musical instruments which are out of tune, so likewise it is

impossible to obtain correct and critical images from lenses whose aberrations are not perfectly corrected.

The compound microscope consists of objective and eyepiece. The eyepiece or ocular is of the utmost importance, and if inferior in quality may ruin the performance of the best objective. The usual form of eyepiece is the Huyghenian or negative one, besides which we have the Kelner eyepiece, the Ramsden or positive eyepiece (which is almost only used as a micrometer eyepiece), the achromatic ocular, and the new compensating eyepieces of Carl Zeiss, which are specially constructed for his apochromatic objectives. These compensating oculars give splendid definition and improve the performance of other objectives as well as of that of the apochromatics. They magnify the image projected into them by the objective up to twenty-seven times diametrically. Professor Abbé has devised special projection eyepieces for photographic purposes and for the lantern microscope, and they give perhaps, the finest definition of any eyepiece made, but their field is much smaller than that of the Huyghenian and other oculars. Besides projection eyepieces, ordinary concave amplifiers, such as those I have here, which were made by Ross & Co., will be found very useful, as they absorb but little light, give a large field, and do not impair the definition of the objective to any appreciable and noticeable extent. The question is often asked, and seldom satisfactorily answered, whether the eyepiece should be used or not when photographing with the microscope. Well, I think the answer depends entirely upon circumstances, such as the size of the image we wish to project, the length of the camera at our disposal, and the objective we intend to employ. Should this latter give us a flat, well-defined image on the screen, and should our camera be sufficiently long to obtain the requisite size of the image without an eyepiece, then it would obviously be superfluous to employ one, as it would only absorb a quantity of light, and, unless of the best construction, would impair the performance of the objective. If, on the other hand, the performance on the screen of an objective should be improved by an eyepiece—for example, by a compensation or Abbé's projection ocular—and if we should wish to obtain a higher amplification than we can obtain by the use of the bellows alone—then we must use an eyepiece or an amplifier, but it is always advisable to use one of long focus. It is a popular fallacy to suppose that the Huyghenian eyepiece improves the flatness of the field. When photographing with the objective alone we find a practical application of the law of conjugate foci of lenses. The further we draw out the bellows of our camera, *i.e.*, the further we remove the posterior focus of our objective, the nearer we have to focus the objective on our object, or the more do we reduce the working distance which, with high powers, may ultimately result in the working distance being so far reduced that the objective does not work any more through the cover glass of the object, thus imposing a limit upon the amplification on the screen.

The question next to be considered is that of the light to be used in photomicrography. By far the best light, at least for high powers, large amplifications, and for shutter exposures, is sunlight, owing to its great intensity, its great actinic power, and to the parallelism of its rays. By its aid we are enabled to see some of the finest structural detail which the microscope is able to reveal. Sunlight cannot easily be used direct, owing to the earth's rotation. To insure the falling of the sun's rays on our microscope constantly from the same direction we must receive them first on the reflecting mirror of a heliostat, which is a clock-work arrangement moving a spindle set parallel to the earth's axis or at angle with the horizon equal to the latitude of the place. This spindle carries the reflecting mirror once round its axis in twenty-four hours. A second mirror is often interpolated, but these mirrors must be perfect planes, else the parallelism of the sun's rays will be destroyed. Unfortunately the sun is not often to be depended upon, and the photo-micrographer has to press humbler luminaries into his service. The light next to the sun, as far as its actinic power is concerned, is the magnesium light; but the lamp for the successful employment of this excellent photographic, and now cheap, light, has still to be constructed. The points to be attained are not only a steady combustion of the magnesium ribbon, but also that provision

should be made for collecting every particle of calcined magnesia, so that none can settle on the object and on the front lens of the objective, as in this case the enlarged images of such particles will be photographed along with the object. A few inches of magnesium wire slowly pushed through a brass tube hammered flat will suffice to give a vigorous negative when the object is magnified several hundred diameters. The electric light is rich in actinic rays, but has, on the whole, not found much favor with microscopists, for the arc light is troublesome, expensive, unsteady, and gives off a great deal of heat. The incandescent light is far more suitable and handy, but as the first principle of microscopical illumination is to project a sharp image of the source of light in the plane of the object, the image of the thin glowing carbon film, if projected by a sub-stage condenser of short focus, becomes often too small to cover the object. The power of the battery, if one is used, must be sufficient to render the film of the lamp glowing quite white, for if this is not the case we may get abundance of red light on the focusing screen, but not sufficiently rich in actinic power to get an image on our sensitive plate, as I found once to my great disappointment. As even the incandescent light is troublesome to generate, unless by a small dynamo driven by power, it has, from this reason and from the one mentioned before, not made much headway in photo-micrography.

The oxyhydrogen light has been made much use of of late in photo-micrographic work, notably by Professor Crookshanks. This light is exceedingly steady and intense, and since oxygen is being supplied commercially in a compressed state in steel cylinders, its advantages over some of the sources of light mentioned are obvious, although the lime light, as it is commonly called, possesses relatively less actinic power than either the magnesium or the electric light. The lime light is especially useful for photographing bacteria, for which nothing but a central cone of light is required.

The last available source of photographic light is a good paraffin lamp, and in it we have an excellent, manageable and cheap light, which is always at our disposal, and which suffices for photographing objects under magnifications of from 400 to 500 diameters, so that we can even photograph with high powers by lamplight. All, then, that is required is a good microscope lamp, having one flat wick, of which we can employ either the edge or the broadside, as circumstances require. The lamp must be adjustable in a vertical direction, and the flame should be inclosed in a metal chimney, having a window on one side, or the glass chimney should be surrounded by a porcelain shade having an opening on one side. I line my copper chimney with plaster of Paris, so that it reflects as much white light as possible through its window, which is filled out with a disc of light blue glass. Nearly all my photographs were taken by lamplight. Any ordinary paraffin lamp costing about one shilling can be made to do excellent service in photo-micrography. It is essential that the very best paraffin oil, such as crystal oil, be burned in microscope lamps, especially when used for photographic work. Inferior paraffin oil possesses elements of danger, especially when burned in lamps having metal chimneys, as these latter get very hot. Gaslight is not suitable for our purpose, as it possesses too little actinic power, and is not steady enough.

(To be continued.)

OUR ILLUSTRATION.

THE handsome study in photographic portraiture with which we illustrate this issue of the BULLETIN is from the studio of Mr. O. P. Scott, the Secretary of the Photographers' Association of America. He has been awarded several medals for his fine studies, and at the Boston Convention received a gold medal for his genre pictures. Mr. Scott is a young and enthusiastic worker in the art, and his fame is destined to become greater as the years roll by. He is a careful student of artistic effects, and the beauty of his work tells better than any words of ours of the success he has attained.

THE DAGUERRE MONUMENT.

To the Editors of Anthony's Photographic BULLETIN:

At the Convention held in Boston under the auspices of the Photographers' Association of America, a committee was appointed to erect a memorial in honor of Daguerre, the money to be raised by dollar subscriptions from among those interested in the art of photography.

For the purpose of reaching that class as far as possible, I am sending out check-books to all merchants and manufacturers, trusting that they will assist in raising such a sum as will enable us to erect an imposing memorial to the great Frenchman, and one that will reflect credit upon the photographers of America.

This memorial will be placed in the Smithsonian Institute, at Washington, D. C., at the opening of the next convention, which will be held in that city some time next summer. A report will be made at the next convention of the amount raised by each house, and the name of each person who subscribes one dollar will be deposited within the monument.

The committee, composed of the executive board of the Photographers' Association of America, for 1889, have spent six or eight weeks in correspondence with different artists with reference to style and price of such a memorial, and have come to the conclusion that the sketches submitted by the celebrated sculptor, J. Scott Hartley, of New York, are the most satisfactory. Mr. Hartley sends four sketches, ranging in price from \$2,500 to \$6,000. Nos. 1 and 2 will cost \$2,500 each. These designs contemplate pedestals 3 feet 6 inches high, No. 1 to be of richly-carved oak, and No. 2 of granite, with bronze bas relief. A design of oak or laurel framing the relief on wood pedestal, showing Daguerre experimenting with camera. Both pedestals to be surmounted by a bust of Daguerre in bronze or marble.

No. 3 can be executed for \$3,000, and consists of a globe and rough un-hewn base in granite, globe polished and map incised and encircled with laurel wreath in bronze and surmounted with a cast bronze bust of Daguerre, the whole to stand five feet high.

No. 4 contemplates something more elaborate, and consists of a pedestal or base in unpolished granite, the name of Daguerre in polished letters. This base is surmounted by a globe of polished granite, map incised with wreath of laurel, medallion portrait of Daguerre and life-size figure of Fame in standard bronze.

The design represents Fame taking the laurel which encircles the earth and placing it about Daguerre as a frame-work. The whole is to stand 9 feet high, and would certainly present many unusual art possibilities. There would be little profit to the artist at \$6,000, for which sum he agrees to erect it. I think you will all agree with me that it will not be too much for the dignity and importance of the subject.

I hope to have a report from all those holding check-books by January 10, 1890, that we may estimate how the subscriptions are progressing, as the committee meets about that time to determine which design will be chosen.

H. McMICHAEL.

IMPROVED COLLODIO-CHLORIDE EMULSION.

THE beautiful results obtained with aristotype paper have led to the production and improvement of this old but beautiful emulsion. Our publishers are now making an improved emulsion, and furnish a paper to serve as a basis upon which it is flowed, together with a special apparatus that greatly facilitates its use. Photographers will thus have placed in their hands a simple and easy method of making some of the most beautiful prints ever produced by photography, the well-known aristotypes. It is also to be recommended to amateurs because of the ease with which it is manipulated and the beauty of the results.

you do, articles that I would gladly recommend to every lover of the art. For example, 'Captain Abney's Address to the British Association,' 'Lenses for Hand or Detective Cameras,' by J. Traill Taylor; 'The Chemistry of Mercury and its Salts,' by P. C. Duchochois; practical hints from the reports of societies, together with a number of other valuable contributions, all in a single number of Anthony's BULLETIN, and worth at least to every student of the art a year's subscription.

"In reading these journals, it sometimes happens that we meet with statements and formulas not in harmony with our preconceived opinions, and the question arises—who is nearest the truth, the author or ourselves? It is statements of this sort where combined experience can best determine the truth of the matter. Hence it is far better to seek counsel concerning such statements than to declare them false, simply because they do not tally with our experience. An example occurs in the November number of the *American Amateur Photographer*, page 176, where the author, in speaking of toning prints, says: "Use 1 grain of gold for each half-sheet of paper, of the bicarbonate of soda about 10 grains, and of salt 20 grains. The above quantities of chemicals are dissolved in 10 ounces of water," the salt being introduced to properly bleach the deeply-printed proofs. Now this formula may be all right, and yet it is quite different from my mode of making toning baths. In my practice I have found 1 grain of gold sufficient to tone a sheet of paper, but never 2 grains of salt in each ounce of water sufficient to bleach deeply-printed proofs. One of the best formulas I have ever issued is, to dissolve in every 4 ounces of water 60 grains of borax and 1 grain of chloride of gold. After the prints are toned and fixed, soak them in a strong solution of salt and water, not for the purpose of bleaching them, but to keep them from blistering. If they remain in this solution too short a time, or the solution is too weak, they will sometimes blister in spite of the salt."

P. C. DUCHOCHOIS said: "I believe 2 grains of salt in each ounce of a toning solution of not much use as a toning agent, and although the tenth of a grain of gold might be sufficient to tone if the solution is hot, I should certainly prefer a much stronger bath."

Messrs. NEWTON and FARIS also favored the use of a strong toning solution and a bath for silvering the paper, 40 grains of silver to each ounce of water, rather than 60, as recommended in the article under consideration.

The regular hour for closing being announced, further talk on the subject of printing and toning was postponed to some future occasion, and the Chairman declared the meeting adjourned.

THE CHICAGO CAMERA CLUB.

THE regular monthly meeting of the Chicago Camera Club was held at the club rooms, No. 182 Wabash avenue, Thursday evening, November 14th, *President WILLISTON* in the chair. The attendance was large. After the transaction of some regular business, the *Secretary* called the attention of the members to two new view cameras recently purchased. A $6\frac{1}{2} \times 8\frac{1}{2}$ "St. Louis" camera with Dallmeyer R. R. lens and Prosch shutters, and a $4\frac{1}{4} \times 6\frac{1}{2}$ Universal camera with Baush & Lomb lens and shutter. These have been purchased for the use of members of the club, and may be taken from the club rooms for not exceeding twenty-four hours without charge. Attention was also called to several new pictures adorning the walls, including Prosch's "Evangeline," which captured the first prize at the Boston convention. Also a large album containing about one hundred cabinet pictures of celebrities by leading artists, which the members might use as examples in lighting and posing.

The chair then announced that the club had imported specimens (probably the first in America) of the new developing agents, pyrocatechin and para-phenylendiamin. Samples had been given to various members to experiment with, and reports were asked for from Professors Garrison and Bartlett, Dr. Nicol and Messrs. Morrill and Harley. While it is unnecessary to give the reports in detail, we will try and mention the principal points. Pyrocatechin is a feathery substance of light straw color, and with a strong odor of carbolic acid. It dissolves readily in water, and is said to be fifteen times the strength of hydroquinone (which we doubt, though the writer developed successfully a $6\frac{1}{2} \times 8\frac{1}{2}$ plate in a solution containing only 1 grain of pyrocatechin). The usual developer (made with carbonate of potash) works a trifle slower than a normal pyrogallol developer, and gives less density, but produces negatives of crystal clearness in the shadows and of fine printing quality. A transparency was shown which had lain for two hours in an old solution (being under-exposed), and had resulted in a perfect picture, and without a stain. The foreign formulas state that pyrocatechin solu-

tion can only be used once, but Dr. Nicol had disproved this by developing twelve plates, in the same solution, in an interval of two weeks, the last one being the transparency above-mentioned.

Para-phenylendiamin had not so many friends, is a substance resembling eikonogen (but evidently of entirely different composition). It dissolves readily, and is used without sulphite, which would seriously retard its action. The formula, we think, has never been published, so we give it here: Make a solution of one part of para-phenylendiamin to fifty parts of water. Take one volume of this with two volumes of a 10 per cent. solution of carbonate of potash. Development proceeds very slowly, and results in a negative of a slightly brown or wine-colored tinge, very clear in the shadows, but somewhat lacking in density. On the whole it was concluded that neither possessed the good qualities of eikonogen, and if they did, their present high price would be prohibitory, as pyrocatechin now costs about \$7 dollars an ounce, and para-phenylendiamin about \$1.25.

Negatives were shown giving comparative results in which eikonogen was far in the lead in regard to both detail and time, though the impression seemed general that pyrocatechin might be a perfect developer for lantern slides, and other work requiring absolute clearness in the unexposed portions of the plate. The room was then darkened, and the members were entertained with Mr. Buehler's lantern slide, "Trip Around the World," and a series of views taken by Dr. Matteson in Alaska, which were thrown upon the screen with the McAllister lantern.

FRED. K. MORRILL, *Secretary*.

ST. LOUIS CAMERA CLUB.

THE regular meeting of the club, November 4, 1889, was called to order at 8.15 P.M. by *President* BAIN, with twenty-six members and about fifteen visitors present.

The minutes of the last meeting were read and approved as read.

The Membership Committee recommended the election as active members of the club of Dr. George J. Engleman, C. W. Gilson, H. A. Benoist and F. A. Banister.

After balloting they were all declared unanimously elected.

Upon motion of Mr. Collins, Mr. George C. W. Belcher, proposed by Mr. Melcher, and Colonel J. L. Torrey, proposed by Mr. Compton, were unanimously elected honorary members of the club.

Applications for active membership from Messrs. J. W. Thorne, George O. Carpenter, Jr., Frank O. Nohl, Frank H. Fletcher, and Dr. C. V. F. Ludwig were read and referred.

Upon motion of Mr. H. M. Holland, a vote of thanks was tendered Mr. J. C. Somerville, for presenting the club with a burnisher and one-half gallon of alcohol.

Upon motion of Mr. Butler the Secretary was authorized to purchase a ballot-box for use at the club.

Mr. MELCHER, Chairman of the House Committee, upon being called upon by the President for a report, stated that, as nearly as could be calculated at present, the cost of building the dark room would be as follows: Plumbing, \$25; carpenter work, \$38, and painting, \$15.

President BAIN—Is there any member present who has tried the new developer, eikonogen?

Mr. COLLINS—I have tried eikonogen, and can only say that, so far as I have gone, I like it very much. With me it works about like hydroquinone. It is rather slow in developing, but, unlike hydroquinone, it continues to develop slowly, and it gives great detail, and will develop a plate that has not two-thirds of the exposure that a plate needs in order to be developed with pyro, and I do not think that two-thirds of the ordinary exposure is necessary. I have not completed my experiments with it.

Mr. BENECKE, of the Cramer Dry Plate Works, explained the composition of dry plates and the action of a developer upon an exposed plate.

Mr. BOISSONNAS, of the same establishment, exhibited a small camera in the form of a pistol, which he called "L'Escopette," and explained to the members how it worked. He also exhibited quite a number of views taken with the camera.

Mr. SCHULTZ, of St. Louis, exhibited a magazine camera, and explained the construction of it for the information of the members, and passed around a number of negatives taken with it.

Upon motion, adjourned.

After the meeting over two hundred lantern slides, made by the members, were exhibited. About fifty of the slides were made and nicely colored by Dr. C. H. Goodman, and were from views taken by him in Europe during the past summer.

GEORGE B. COMPTON,
Secretary.

NEW ORLEANS CAMERA CLUB.

At the annual meeting of the club, held November 28th, *President* H. T. HOWARD occupied the chair.

The report of the Treasurer, Mr. P. E. Carriere, was read and approved, and showed a handsome balance in the treasury.

The report of the Secretary, C. H. Fenner, was approved as read, and showed a membership of 71 active, 11 honorary and 4 corresponding members. The names of four ladies appear on the rolls.

Mr. A. L. Du Quesnay stated, on behalf of the Lantern Committee, that during the year eight public lantern slide exhibitions had been given.

Mr. Howard, on behalf of the Governing Committee, gave a *resumé* of the year's work, and read a number of rules, which were adopted unanimously.

The report of the Purchasing Committee, through its secretary, Mr. R. S. Charles, Jr., was approved as read, and a unanimous vote of thanks tendered the retiring committee for the admirable manner in which they have conducted the construction of the dark room, the plan of which was devised by Mr. A. L. Du Quesnay.

Under the head of new business, Mr. Carpenter, Chairman of the Benefit Committee, reported that a handsome sum had been realized from the sale of tickets, the proceeds of which was to be set aside for the embellishment of the club. Mr. Carpenter stated that he wished to particularly thank Messrs. S. L. Mitchell and B. C. Shields for valuable services rendered.

Mr. Carpenter was tendered a unanimous vote of thanks as chairman of the committee and also as lecturer.

Mr. Carpenter moved that the Governing Committee have full power to make all rules and regulations for the government of the dark room and to enforce them.

The applications of Messrs. B. J. De Grange, Rev. G. A. Rouxel, N. S. Hoskins, W. T. Maginnis, W. E. Underwood, Mrs. Garrett Brown and Mr. Garrett Brown were read, and they were unanimously elected to membership.

The election of officers for the ensuing year now being in order, Mr. H. T. Howard was re-elected President; Mr. Joseph A. Hincks, Vice-President; Mr. R. S. Charles, Jr., Secretary; Mr. P. E. Carriere, Treasurer.

In each case the Secretary was ordered to cast the vote. All of the present incumbents

have been re-elected, with the exception of Mr. R. S. Charles, Jr.

The following committees were appointed to serve for the ensuing year:

Finance Committee—S. L. Mitchell, Chairman; B. C. Shields and Charles H. Fenner.

Membership Committee—Dr. William R. Mandeville, Chairman; James Moulton and George H. Dwyer.

Lantern Committee—Horace Carpenter, Chairman; Placide Réynes, L. E. Bowman, T. W. Castleman and Reeve Lewis.

For the complimentary lantern slide exhibition, Friday, 29th instant, at which the Louisville Camera Club slides will be shown, Mr. Horace Carpenter was appointed lecturer.

There being no further business, the meeting adjourned.

LYNN CAMERA CLUB.

A SPECIAL meeting of the Lynn Camera Club was held Tuesday, November 19th, at which time the final report of the Committee on Entertainment was accepted, and the entertainment for the opening night was brought up for discussion. It was decided to hold an informal exhibition of prints at that time, and members are requested to furnish one or more prints of any subject to be hung in the rooms for inspection.

The following persons were elected to active membership: Miss Julia F. Callahan, Miss Minnie A. Callahan, Roy Bartlett, William S. Clough, Miss Anna B. Clough. A. H. Carsley was elected to social membership.

The club will make application for incorporation this month.

On Wednesday evening Mr. Millburn gave a demonstration on the new "transparent film," and showed the new large-size Kodak. Those present were photographed by flashlight, in the unfinished rooms of the club, with very good result. The members were well pleased with the demonstration, and another is promised in the same line when the new rooms are completed, so that there can be more persons accommodated.

On Thursday evening, November 21st, a good-sized audience, composed of members of the club and their friends, occupied Association Hall for the second public entertainment given under the auspices of the Camera Club. During the first part of the evening the following programme was rendered by Chase's Orchestra and Charles H. Currier, assisted by Melvin Rhodes and Bert Alexander: Orchestra, Crown Prince March; recitations, *a.* "The Dutchman Setting the Hen;" *b.* "Mother's Doughnuts," Charles H. Currier; cornet solo, Culvia Polka; recitation, "No. 5 Collect Street," Charles H. Currier; piccolo solo, "Golden Robin," orchestra, melody.

At the close of this portion of the evening's entertainment, Mr. Millburn made two flash-

light pictures of the audience on transparent film, both in a large camera and in one of the Kodaks. The hall was then lighted by the rays from the stereopticon, while Walter G. Chase stepped forward on the platform and began his illustrated talk on "Life Among the Shakers." Mr. Chase evidently spent his time among this peculiar people with good results, for he exhibited some very fine views of the place and photos of the inhabitants. This portion of the talk was over all too soon to suit the audience, and then came the instantaneous pictures taken by Mr. Chase.

Among the most interesting were those of Mrs. Monmouth and her dwelling, the "Economistes," and the Nahant series of views, including many superb wave effects. One colored view aroused great applause, as it showed what fine effects may be obtained by floating in the colors. The now celebrated picture, "A Many Headed Model," which has been copied by the London papers and the leading photographic journals of this country, won the admiration of the audience. The ghost pictures were fine examples of this class of work, while the "Kodaks," with some of the strange distortions produced by these little instruments, were extremely good. The entertainment closed with the throwing on the screen of the negative of the flash-light taken of the audience in the early part of the evening. As an illustration of what can be done in photography this picture was really remarkable.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—W. writes: I am in trouble about my gold with —'s new acids. I have used the same make of gold for twenty years, and never had trouble until now. I first noticed the trouble with the acids bought here, then I obtained others and now I have used —'s. I have always dissolved the gold in nitro-muriatic acid, two of muriatic to one of nitric. There is no trouble in dissolving the gold; all the acids do that well enough. After solution I add water to give a solution containing one grain of gold in each fluid dram. After adding the water much of the gold, say one-half, falls to the bottom of the vessel containing it. This never happened with me until lately, and I use the same proportions as formerly; with —'s acids it is worse than ever. After I pour off the solution, I redissolve the gold that precipitates, but it falls again a second and even a third time, but not as badly as be-

fore. Can I add anything to the solution before I add the water that will prevent this precipitation? I do not neutralize until I use it for toning. It is very acid, and yet the gold precipitates.

*A.—*When gold is dissolved in nitro-muriatic acid, gold trichloride is formed. If this solution is evaporated the muriatic acid is expelled and gold monochloride is formed, which on continued heating deposits metallic gold. It is best to add some more hydrochloric acid and warm the solution gently before trying to dilute it. It requires much care and experience to make good gold chloride for toning, and we cannot see any economy in photographers making it for themselves unless they count their time and trouble as worth nothing. The addition of salt (chloride of sodium) with the extra hydrochloric acid would also insure against the precipitation of metallic gold on addition of water.

Q.—G. J. Van D. writes: In No. 8 of this year, April 27th, you give some remarks of H. J. Newton on making "Collodion Emulsions." Can you tell me where I can get them in full? My reason for asking is that you say he adds 100 grains pyroxyline to each ounce of alcohol and ether. Can this be correct? It seems so large an amount.

*A.—*Mr. Newton tells us that he intended to say that he used 10 grains of pyroxyline in 2 ounces of alcohol and ether. We printed the report as we received it, and it was probably a slip in adding an additional cipher to the figures 10. Mr. Newton now recommends his formula given in the article on Collodion Emulsions in the *International Annual* for 1889, page 374, at the conclusion of the discussion. This seems correct, and will doubtless work well.

Q.—T. G. A. writes: Will you please tell me the cause of the silver-like spots on the print I send with this? Out of half a dozen prints, four had these spots. Paper was silvered about three hours before printing; I cannot detect anything on the negative. Also, can you tell me the cause of blisters on prints coming out of the hypo bath?

*A.—*Your trouble is due to dust or scum on your printing bath. Before using draw a narrow strip of clean blotting paper across the surface of the bath previous to floating the paper, and we think your trouble will disappear. Blisters are caused by the rapid change of the albumen paper from the comparatively weak toning bath to the strong or dense fixing solution. If you use a bath of salt before putting prints into the fixing bath.

your trouble will disappear. Also be careful that all your solutions are at the same temperature, or nearly so.

Q.—J. T. writes: Could you please give me the following information: Has there appeared in the BULLETIN or any other journal articles on the manufacture of ferrotype plates, or do you know of any work written on the subject? I wish to find out, if I can, the nature and ingredients of the composition on the face of the ferrotypes.

A.—Thin iron plates are coated with asphaltum varnish on both sides, and a second filtered coat is applied to the picture side. They are then dried in a hot oven. There has not been anything published on this subject for many years.

Q.—N. A. C. writes: Will you kindly state, through the columns of "What Our Friends Would Like to Know," what is a good test (not too elaborate) for the presence of sodium sulphate in samples of the sulphite? I saw one some time ago in a paper, but cannot put my hands on it now, but think the reagent used was barium chloride.

A.—Make a solution of the sulphite and add to it enough hydrochloric acid to make it decidedly acid to test paper. Now boil the fluid until it ceases to smell of sulphurous oxide. By adding barium chloride to this solution the presence of sulphate is indicated by a precipitate. Remember that the purest samples of sulphite will give a reaction for sulphates a few days after they are made. The best sulphite in the market to-day contains from 2 to 6 per cent. of sulphate, according to age.

Views Caught with the Drop Shutter.

MARRIED.—On Thursdáy, November 21st, at twelve o'clock noon, Mr. W. I. Lincoln Adams, editor of the *Photographic Times*, to Miss Daisy Grace Wilson, at Montclair, N. J., by the Rev. A. H. Bradford, D.D. The wedding was a brilliant one, and the happy couple spent their honeymoon in Northern New Hampshire. We wish Mr. Adams and his bride all the joy that their hearts can desire, with a long, happy and prosperous life together.

WE also note with pleasure the celebration at St. Louis of the silver wedding of Mr. ROBERT BENECKE, of the Cramer Dry Plate Company. May our good friend have many more happy years of married life before him, and live to see the golden period of that happy existence.

MR. LAWRENCE L. DE ANQUINOS, of Murfreesboro, Tenn., sends us the following notice of the death of his father:

"LEBANON, Tenn., November 27th.

"Mr. Alexander De Anquinos, formerly a prominent photographer of Nashville, but who recently located here in the hope of building up his shattered health, died at his home here November 26th, after a long and exceedingly painful sickness. His death was sudden and unexpected, though it was well known that he would never recover."

Mr. De Anquinos' many friends will regret to hear of his death. We extend to his bereaved relatives our sincere sympathy in their time of sorrow.

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YACHT "NYMPH," OWNED BY F. W. FLINT.

NEGATIVE BY JOHNSTON.

AN UNEXPECTED PUFF.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

DECEMBER 28, 1889.

Vol. XX.—No. 24.

THE PHOTOGRAPHIC ASSOCIATION OF BROOKLYN.

SOME time ago we received an invitation to be present at the celebration of the semi-centennial of photography by the Photographic Association of Brooklyn. As our time is always more than completely full of engagements, we thought we should have to forego the pleasure of participating in this interesting event. But fortune favored us, and having an hour or two to spare on the evening set down for the ceremonies, we accepted the kindly invitation of the Secretary, Mr. C. M. Heid, and went to Arion Hall, Brooklyn, to see what our friends had to exhibit and tell us about matters photographic.

The association has always been very modest in its announcements, and we had only heard occasionally of its more important work. We were very much surprised, on entering Arion Hall on the night of the celebration above mentioned, to find a very large exhibition of pictures, the work of the members, and we also enjoyed an excellent display of lantern slides made by the same gentlemen.

The exhibition was a competitive one, and a number of prizes were awarded for the best pictures. There were three medals (gold, silver and bronze) for the three best exhibits, without regard to subjects. Then there was a prize of a lens for the best landscape. Another prize, a handsome antique silver cup, for the best general picture. A third prize, a handsome album, for the best portrait and genre work. A fourth prize, an instantaneous shutter, for the best instantaneous work; and, lastly, a prize of condensers and lens for lantern, for the best flash-light picture.

Such an array of trophies to capture naturally brought out the best work of the members, both professional and amateur, but in order not to embarrass the judges, every exhibit was marked with a motto or sign, and not with the maker's name. This is a method that some of our prominent camera clubs and associations might do well to imitate. It saves an immense amount of bad feeling, especially if outside but competent persons are selected as judges.

We cannot spare space enough in these columns to do justice to all the good work which we saw that evening; but a few comments upon some of the more striking exhibits may not be unprofitable.

The exhibit marked "Ara pro nobis" contained some excellent interiors, and four pictures upon the sea-shore, which were very good indeed. "Alpha

and Omega" exhibited an excellent piece of architectural work, the Williamsburgh Savings Bank; a picture difficult to secure, and certainly skillfully caught. "Dixi" had a number of quarter-size detective shots of very good execution. The work of "Sombrero" was quite good, especially two flash pictures. "C. F. F." had a very pretty garden scene, with a creeping plant growing over brickwork; the subject was artistic and well done. "Sans Souci" had a flash-light group at a piano that was excellent; also an excellent picture of a rustic bridge, a particularly pleasing bit of scenery. "Ars Longa Vita Brevis" had a picture of the Obelisk in Central Park that was quite good for such an object, the lighting of it being good only at certain hours and seasons. The exhibit marked with an arrow through two circles had a very pretty view of an arch with surrounding foliage in one of our public parks. The foliage was particularly finely caught. "Mizpah" had an excellent view of the new Manhattan Bridge over the Harlem, another difficult subject on account of the variability of the lighting. The exhibit marked with an arrow contained a very fine view of the State Department at Washington, D. C.

Two of the best pictures in "Nil Desperandum" were a stone arch and an old mill, both of which were well done and artistic. "Dacapo" exhibited some excellent portraits and some uncommonly good groups. The lighting and posing in these were very well done. "Light and Truth" had a number of groups that were among the best in the exhibition. The work was uncommonly clear and well finished. In the same exhibit we found some fine photomicrographic work; sections of wood and the claw of a beetle were excellent. "Light and Shade" had some good portraits and a number of very picturesque views. Dr. Emil Rauth exhibited some excellent views with cascades of water in them. Here also was found a very good group of ladies, and a portrait of a gentleman with book having a natural foliage background. The latter picture was a very good piece of photography. Dr. F. A. Schlitz exhibited a number of cascade views of excellent quality, together with a number of other scenes also well done. An exhibit with the motto, "The glorious sun stays in his course and plays the alchemist," contained some of the best portraits in the exhibition, also a very fine flash-light group. A large group (a picnic?) of about one hundred and fifty people in the same exhibit was very finely done. Mr. G. W. Wundrum, whose farm studies are known to our readers, had an excellent group taken in a garden, a fine view of Manhattan Bridge, and three fine interiors, one of which appeared to be the trophies of the hunter: a number of stuffed birds, with guns and game bags—an excellent composition. "Ambitious" exhibited some uncommonly clear and neat work in the form of groups; also some excellent instantaneous views.

Among other interesting exhibits we noted some fine daguerreotypes made by George Whitney, 1846 to 1848, and very well preserved.

Then there were portraits and views made on the new Pizzighelli platinum papers—excellent examples of the work. Autotypes by Edward Bierstadt, of New York, on paper and also on satin—beautiful pictures by a beautiful process. Also photolithographic reproductions of engravings by R. A. Wilke, fine examples of photomechanical printing.

In addition to the exhibition of prints and lantern slides, there was an excellent selection of music furnished during the evening, and a social reunion among the members of the most agreeable character.

The association is but little more than a year old, and if the enthusiasm of the present membership is maintained we may hope to hear of good work from this band of earnest workers.

The membership consists of both professional and amateur photographers, and the good feeling that exists between them is one of the most agreeable features of the association. May they continue long together and prosper is our most earnest wish.

EDITORIAL NOTES.

THE question of fire insurance for photographers is taking shape in England in an amelioration of the high rates of premium hitherto paid. We note that the Westminster Company, of King street, Covent Garden, London, has issued a reduced rate of premiums for photographers' premises and property. If we remember rightly, a committee of the Photographers' Association of America was appointed several years ago to look into the same question for American photographers, but we have heard nothing about it since. It surely would be a great advantage if some of the members of the association would take the matter up in earnest.

PERHAPS one of the oldest amateur photographers of America is ex-Judge Dobbin, of Baltimore, who has just passed his eightieth birthday, and is as enthusiastic about it as the youngest member of the Baltimore Club. He has been interested in the art from the earliest days of the daguerreotype.

THE amateur photographic society of Baltimore recently had a lantern exhibition, the invitations for which were quite unique. The card represented a lantern slide with its black bordered matt having an inside gold line, the printing occupying the space where the picture is usually found. We must congratulate the officers upon the originality of the design.

FREIE Photographische Vereinigung, in Berlin, is the name of the fourth photographic association formed recently in the city of Berlin, with a membership of fifty-two at the start, and among which we notice the names of Captain Himly, Dr. Jul. Stinde, Robert Talbot, Dr. Bannow and G. Gramm. Professor Dr. Fritsch is the presiding officer. The new association has our best wishes.

A NEW photographic monthly, under the title "Lux," has been published in Amsterdam, Holland, since October 1st. The publishers are A. D. Loman, Jr., and J. Schumann.

ITALY has two new photographic publications: "Bulletino dell' Associazione degli Amatori di Fotografia," in Rome, and "Bulletino della Società Fotografica Italiana," in Florence.

OUR Japanese friends are certainly making rapid strides in photographic work. In a recent letter from Professor W. K. Burton he tells us that Ogawa had made some direct landscape negatives upon plates 30 x 40 inches, and the Professor says further: "They are about as good as anything I have ever seen." The prints from them are to be made on platinotype paper on sheets 54 x 42

inches. There is to be a great exhibition in Japan early next year, which is causing much excitement among the photographers there, on account of the photographic section which is to form part of it.

WE note with pleasure the announcement of the marriage of Captain W. de W. Abney, the celebrated English photographer, to an American lady, Miss Mary Louisa Mead, daughter of the late Rev. E. N. Mead, D.D., of Scarborough-on-the-Hudson. Another international alliance. We wish the gallant captain and his bride long years of happiness.

THE Union County (N. J.) Camera Club was organized November 25, 1889, with five active members, five associate members, and one corresponding member. The officers for one year are: President, R. M. Fuller, of Cranford, N. J.; Secretary-Treasurer, J. L. Warner, of Roselle, N. J.

THE New Orleans Camera Club extends an invitation to all members of the American Lantern Slide Interchange and Photographic Clubs generally, to visit its rooms, No. 3 Carondelet street. Letters of introduction from the president or secretary of their respective clubs will insure recognition.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

What is Nuktigonia?—Magnesium Flash-light for Color-Sensitive Plates.—Taking Interiors Facing Bright Windows.—The Compensator, a New Instrument for Equalizing the Brightness of Wide Angle Lens Pictures.—Focusing with and without Stops.—Keeping Qualities of Untoned Pictures.—Uranium Intensifier.—Chromate of Sodium for Photo-Printing Processes.—Dr. Miethe's New Flash Lamp.

Recently I received a sample of a wonderful new American preparation, "Nuktigonia," which is said to permit the development of dry plates by daylight. The same consists of a deep yellow-red liquid of which 1 c.c. is to be added to 120 c.c. of developer. The price of 60 grams of liquid is one mark.

It will be observed at once that the purpose of the preparation is the cutting off of the chemically active rays of daylight. The solution, as discovered by my son, is nothing else but a concentrated solution of a known Azo-color matter, Tropäolin, which is found in the market at the price of 2.20 marks per 100 grams. The value of this invention is very questionable; the red-yellow solution, it is true, keeps off the chemically active daylight, but the plate has to remain in the solution during development; the negative can therefore be examined only from the face side. While the tray is being rocked it may happen that the protecting liquids will run off on one side of the negative, and the light will then affect the plate if the tray is not sufficiently covered.

This shows that the plate will by no means become non-sensitive against daylight by applying the so-called "Nuktigonia," and the formula prescribes, therefore, distinctly to have the tray covered when brought to daylight, to use a black dish for developing, and to add also Nuktigonia to the fixing bath; it says, finally, very explicitly, "not to lift the plate from the developer until the same is ready to be fixed." That the great advantage of controlling the development of

the plate by its transparency is entirely lost by such manipulation, and that the examination by daylight has also its difficulties, needs no further comment. The experiment of developing plates in daylight is also not new. Mr. Jahr, at a meeting of the Verein zur Förderung der Photographie in Berlin, relates that Mr. Kurtz, in New York, developed some years ago at a meeting a plate in a bright lamp light with oxalate developer, which retards also the active light by its brown color.

Mr. Battin is of the opinion that the application of aurin might be still more advisable, and likewise the application of a dipping tray or bath made of red glass, as recommended years ago, so as to examine the plate by looking through it during development. He remarks, however, that many times already he has developed the less sensitive bromide of silver paper under a brown oxalate of iron solution in daylight.

In an American contemporary I read about a great novelty of taking interiors on color sensitive plates with magnesium flash-light. Magnesium, containing not many red and yellow rays, it is recommended to add ingredients, which will produce yellow and red light.

The following is recommended: Pulverized metallic magnesium, one part; nitre, five to seven parts. The flames give a penetrating yellow light, for which the plate is very sensitive. The details of the shadows come out excellently, and the strength of the negative is equal to one made on the most rapid plate and in white light. This method has proved to be very satisfactory for interiors, copies of paintings and portraits.

The quantity of powder to be used changes, of course, according to circumstances, the extremes being from 2 to 30 grams.

To this we would remark, that already two years ago—during the early days of this flash light—Messrs. Gädicke and Miethe applied mixtures containing soda for pictures of colored objects, and obtained also a patent for the same.

Mr. Archenhold, one of my students, had to take a number of interiors lately facing bright windows, and obtained very successful results.

He proceeded in the following way: The light parts of the pictures which could easily be located on the ground glass were completely cut off from the objective by an opaque disk of the shape of the light parts, two precautions being observed. In the first place, the side of the disk facing the objective must be blackened and kept from exposure, to prevent any disturbing reflection; and secondly, the disk should have a very thin wire, by which it can be worked along from one side to the other at a distance experimentally determined, so as to cover just the light parts of the object to be taken, and without the wire being seen on the picture. This manipulation is continued until the dark parts have sufficiently acted, after which the exposure proceeds for a short time without the disk.

This process permits a regulation of the exposure for the dark and light parts of the object in the correct proportion of their intensity. The dark parts will not be under-exposed and the light parts are not over-exposed.

Mr. Stieglitz declares, with regard to the same subject, that the halation obtained generally around bright windows, originates from the reflected light of the back part of the plate. Negatives on "films" would suffer much less.

Dr. Miethe remarks, that for the moderation of this appearance the back part of the plate is coated with a black varnish by some photographers, but this

would arrest the reflection only when it has the same refraction index as the glass, for instance the black of Canada balsam.

Dr. Miethe, who is now editor of the *Wochenblatt*, at the last meeting of the Amateur Verein, called attention to the evil, that the edges of a picture taken with a wide angle lens receive considerably less light than the center part (at an angle of 100 degrees only one-sixth). The whole visual field can therefore be only evenly exposed by a proper reduction of the light in the centre. This was done by a star-shaped piece of pasteboard, which was moved at a certain distance from the lens, covering the same. In place of this Dr. Miethe uses a plano convex lens of smoked glass with a corresponding plano concave lens of white crown glass, which combination is called a "compensator," and is fastened directly to the objective. We recommend this compensator for all wide angle lenses.

At the same meeting attention was called to an optical error, which has had a wide circulation.

We read in many photographic text-books about the change of focal distances with the size of the diaphragms, and it is recommended to make observations about this appearance, because it is an old habit of the photographer to focus the picture on the glass without diaphragms and insert the latter only afterwards.

Dr. Miethe, a great optician, declares that the focus remains the same with new instruments notwithstanding diaphragms. Only old, badly corrected instruments, where the rays could not be brought to an exact focal point, have this appearance.

Another question of general interest, which was spoken about at the same meeting, is the following: The fixed and washed, but not toned positives, give, as is generally known, brown pictures. Are these very durable?

Has the toning another purpose than the changing of the color of the originally brown pictures?

Mr. Stieglitz is of the opinion that the untuned pictures are just as durable as the toned ones, particularly those on gelatine chloride of silver paper; untuned pictures, however, have to be washed more thoroughly. Davanne's experiments have demonstrated beyond a doubt the inferior durability of the untuned pictures. Dr. Wulffinghoff says that gold is chemically less affected than silver, particularly by the various sulphur compounds.

The uranium intensifier recommended by E. Vogel, Jr., was also the subject of conversation at the same meeting. It consists of:

Nitrate uranium.....	1 gram.
Red prussiate of potassium.....	1 "
Glacial acetic acid.....	20 grams.
Water.....	200 "

This intensifies strongly and has also the advantage that parts only of the negative may be intensified separately, by applying the solution with a brush. The intensifier can also be removed again from the whole plates or parts only, by diluted ammonia. By long-continued washing it can also be reduced, the water gradually dissolving the brown substances which effect the intensification. Such intensified negatives are washed therefore only for a quarter of an hour.

At Professor Husnik's establishment in Prague, they use now bichromate of sodium with the best success for all the different photo-mechanical processes:

photo-lithography, photo zincography, leimtypy, pigment process, dusting in process and the latest water licht-druck process.

This salt, in technically pure condition, is one-third and more cheaper than the potassium salt of the same name, and where from fifteen to twenty sheets of different kinds are washed daily and spread upon glass, much solution is used, and much is wasted and lost by the squeegeeing out of the superfluous liquid which is between the paper and glass plate.

Quite an agreeable property of the bichromate of sodium is its enormous solubility in water, so that by application of a strong bath, or an abundant addition to the albumen, gelatine, dextrin, etc., the crystallization of this salt will never be accomplished. The potassium salt will dissolve in ten to twelve times its weight according to the temperature of the water, whereas the sodium salt will dissolve in only double its quantity of water.

The sodium possessing a much smaller atomic weight than the potassium, more chromic acid is bought, for instance in one kilo of the sodium salt in question than in the potassium salt of the same name; and it does not require therefore such strong baths to obtain the same effect; but this advantage is to some extent counterbalanced by the circumstance that all bichromate of sodium salts which are found in the market contain water, and are produced in that condition for the convenience of dyeing establishments who apply only potassium salts for their solutions, and would otherwise be forced to make a change in the weight of the new salt for their formulas.

For the above reasons, Professor Husnik says: "I can recommend this salt warmly for all reproduction processes, and I am certain that every one, after a first trial, will continue to use the same."

One of the latest novelties is Dr. Miethe's newly constructed magnesium flash lamp, for the use of magnesium powder only and not for any explosive mixtures. The lamp consists of a simple Bunsen burner in whose flame the magnesium powder is blown from the side obliquely toward the top. At some distance above the opening of the burner is a burning disk in diagonal position, toward which the magnesium powder is blown, so that a scattering of the powder and complete ignition is effected. Dr. Miethe declares that if he departs now from his and Gädicke's principle of the explosive magnesium mixtures, it is for the reason that with the latter only the surface of the flame is of any effect, this being very opaque. In consequence of this opacity all the magnesium burning up in the inner part of the large explosion flame would be lost for the light effect, while with the powder-light every particle comes into use. Much smaller quantities of powder are therefore required for his new lamp.

BERLIN, November, 1889.

THE PHOTOGRAPHIC EXHIBIT AT THE AMERICAN INSTITUTE FAIR.

THE regular fall exhibition of photography at the American Institute Fair is now a thing of the past, and we put on record our impressions of the pictures exhibited. Taken altogether, the quality of the work showed improvement in many cases, while in quantity it was fully up to former years. As we remarked some time ago, there is not that interest in the photographic department of the fair which we should like to see. We are not acquainted with the efforts made by the managers of the fair to secure pictures; but at any rate the exhibition is generally known, and photographers should take this opportunity every year to

show the world of New York what they are doing. Perhaps it would promote more competition if fewer prizes were offered and their value concentrated into but three or four handsome medals that would be well worth striving for. Under the present arrangement almost every one who exhibits gets a medal. A competition under such circumstances becomes somewhat tame, when really meritorious work is rated very little higher than that which is obviously inferior.

By far the most important exhibit was made by Cramer, of St. Louis, where pictures from the studios of such artists as Decker of Cleveland, Stein of Milwaukee, Guerin of St. Louis, Landy of Cincinnati, Rösch of Chicago, McMichael of Buffalo, attracted crowds of the visitors at the fair. We looked over this exhibit on several visits to the exhibition hall, and on every occasion a number of people were always crowding one another endeavoring to get a view of the wonderful examples of modern photography seen upon the walls in the Cramer exhibit. Many of the pictures were from the exhibitions of the Photographers' Association, and have to be seen to be appreciated; any description of ours at this time could not do them justice.

It may be said that all these pictures were exhibited to show the merits of the Cramer dry plate. That is perfectly true; but of all the crowd who viewed them how many cared about the plate that the negatives were made upon? They looked at these pictures as objects of art, as beautiful results of human skill, and there are scores of photographers within one hundred miles and less of this great city who could help to make just such an attractive show every year. We must congratulate Mr. Cramer for his enterprise in showing what the West can do in artistic photography. We are glad to note that these fine pictures obtained a special silver medal.

In the alcove next to the Cramer exhibit we found a collection from the studio of Rudolph Wilhelm, of New York, who received a bronze medal for superiority. These pictures consisted of crayon and pastel portraits and ordinary photographs. The portraits exhibited showed decided artistic advance over former years. The cabinet pictures were very good, and here also much progress has been made by this artist.

J. B. DeYoung had an exhibit of oil and crayon portraits in which the former were the superior in our minds. He received a bronze medal of merit.

As usual, C. D. Fredericks had a fine exhibit of crayon, pastel and water color portraits, as well as regular photographs. All this work was well done, especially some characteristic portraits of prominent New York men. A portrait of Chauncey M. Depew was an uncommonly fine effort, and one equally good was of the late Samuel J. Tilden. We also noted in this exhibit some glacé plaques for miniatures that were little gems of photographic skill. Mr. Fredericks received a bronze medal for superiority.

George G. Rockwood also received a bronze medal for superiority. His exhibit was another attractive center. A fine view of Westminster and the Houses of Parliament in London was an excellent piece of photographic work. A fine crayon portrait of Cornelius Vanderbilt was also another good effort of this artist. Yet another was a portrait of Walter Damrosch, of symphony concert fame, full of life and character. Here we also found a portrait of Engineer Eiffel, of the tower at the Paris exhibition. This exhibit likewise contained several beautiful enlargements on bromide paper from untouched negatives, showing some uncommonly fine work in this department of photography.

M. B. Parkinson had an excellent exhibit of his fine, large portraits. These are notable for the beauty of modeling and the life-like character of the faces. A very fine group of a children's party was also seen in this exhibit. Mr. Parkinson's success with his special adaptation of the electric light in his studio is quite remarkable, and he exhibited a number of fine portraits made with this method of illumination. A bronze medal for superiority was awarded to this exhibit.

F. Gutekunst, of Philadelphia, again found it worth while to send an exhibit to the fair; and it is always well worth seeing. His medallion pictures of children and ladies are very beautiful. He also had an excellent exhibit of photo-type work showing the application of photo-mechanical printing to illustrative processes. There is no better work of this character that we have seen. This exhibit received a bronze medal for taste.

Edward C. Dana, of New York, had an unusually handsome exhibit of small portraits and groups, which was a center of attraction. Mr. Dana's work is always brilliant, life-like and artistic, and we note a steady progress to yet higher levels every year. He received a bronze medal for superiority.

L. C. Perkinson had an exhibit that contained some good portrait work of small size, and his display was attractive. A bronze medal for merit was awarded this exhibit.

We cannot close this hasty review of the photographic department of the American Institute Fair, without noting the work of Joseph Hall, who gave practical exhibitions of flash-light photography. His particular alcove was well patronized, and there is no doubt that he got his reward for his enterprise. The portraits and groups exhibited were examples of the best flash-light work we have seen. The alcove was turned into a veritable studio, and scores of people had their portraits made by this latest development of photography. He received a bronze medal for excellence.

Altogether the exhibit at the fair was well worthy of the attention of every one interested in photography; and we sincerely hope that the popular interest now felt in the art will make itself evident in future exhibitions at the Institute. If we can in any way assist to this end we shall gladly do so.

MRS. CHRISTMAS.

A RETOUCHER'S STORY.

BY MISS ADELAIDE SKEEL.

I.

IVY DAWSON is a retoucher in a big photographic gallery. New York is full of girls just like her, and I dare say you have often seen her curly back hair over the nape of her slender, white throat, if you have not caught a glimpse of her rosy face and smiling lips. She sits in the strong light of —— Studio window, her head bent over her easel, a magnifying glass in her eye, a pointed pencil in her hand, busy from dawn to dark taking out wrinkles and putting in dimples. She needs no retouching herself, poor dear, but in spite of her shabby dress looks as bright as a blue print on fresh ferro-prussiate paper, and is to all appearances as contented a breadwinner as can be found in the whole city.

Nevertheless she says, last Christmas, when she heard her landlady talk of the yards of ground pine sold in Fulton Market; when she saw hemlock trees

carried into churches, and caught glimpses in the shop windows of holiday presents she had no money to buy, she had a bit of a heartache, because in all the season's gladness she touched nothing but gelatine films and nothing and nobody touched her. Poor little Retoucher! If she only knew a child for whom she could dress a doll; a boy for whom she could knit a comforter or a pair of mittens; but there were no children in the boarding house, and the only boy she knew ran the elevator and dressed like a dude. Ivy, however, being busy finishing photographic Christmas presents—so many girls give themselves away, you know, at this season—had, in point of fact, no leisure for day-dreams, and with more pictures to touch up than she had time to touch them in, could not find many spare moments for low spirits. She had her own little personal grievances of course—as who of us has not, develop we ever so wisely, or restrain we our passions ever so moderately? Ivy was a nice girl, and a clever retoucher, but she was not one of the “four hundred;” she was pretty and good, but not *de nôtre*. God made her and made her well, but she was nobody. Last summer at Coney Island she met a man who was somebody, but, of course, after her holiday was over, the little romance came to an end. Ivy ended it herself; and now, at holiday time, as she sat retouching, she one day heard his name. She was doing a Senator's nose, a big nose on which Nature had failed, when the voice of Mrs. Lang from the inner office reached her ear. Mr. Lang, photographic artist, could not tell his wife as he told his sitters, to “Keep still and look pleasant,” it seems.

“It is too bad of Eleanor and it is shabby of Tom French. I say lovers, or ex-lovers, are selfish pigs; so there!”

As Mr. Lang made no response, his wife's voice, now slightly raised, went on:

“Isn't Christmas a time for love and charity, peace and good will? Because Nelly happens to be my sister, and Tom French your fourth cousin four times removed, I can't help them both being fools, can I?”

Mr. Lang nodded, Ivy took another pencil, and then the plaintive moan went on:

“It will shatter the children's faith in Santa Claus for life if Tom does not dress up as usual and give them their toys off the tree.”

The next day there was another interview, which Ivy enjoyed through an open door. She was putting smile lines in a solemn old dowager's face, and she dotted vigorously while she listened.

“You say Tom has flatly refused; and Eleanor tells me she won't leave her room if he enters the house. What does he say to that?”

“He won't enter the house.”

“It is cruel in them both to be such spoil-sports; and you had planned the flash-light picture, too.”

“Too bad!”

“Tom and Eleanor are idiots. Why did they fall in love, and why did they quarrel, and why did they make an engagement just to break it again? Why can't they meet? Why can't he be Santa Claus if he can't marry Nelly? I wish I were a Pilgrim mother, born with a Puritan hatred to Christmas. Its mere bother than its worth! Good-bye.”

Nearly a week elapsed before Mrs. Lang again appeared, and this time she grew so desperate in her despair, that her husband, sitting behind his plate-glass

careful of highly polished, cabinet-sized photographs, \$10 a dozen and orders out for duplicates, felt himself the poorest man on Broadway.

"Lydia," he said, suddenly, "why not get a substitute? Where are all those people you are always asking me to take for nothing in groups? Where are your Royal Sons, your Ministering Children, your Friendly Girls? Can't they help us?"

"You speak of them as if they were paupers. We can't ask it of them and not pay them, and we can't pay them——"

"Advertise in the *Herald* :

—WANTED AT THE LILACS—

ON

CHRISTMAS EVE,

A :- SANTA :- CLAUS.

Reference from the last place required."

"Ned, I should be afraid of the spoons ——"

"Then, Lydia, drop it. And now you'll lose the train if you delay."

Ivy, busy over a baby's head, softly humming a carol, looked up presently to see her employer before her. On a sudden she spoke, laying down her pencil, pushing the frame from her, and turning her blushing face towards the unhappy man who wanted something money could not buy :

"I don't belong to any society, or guild, or league, or even to a church," she said, tremblingly, "but I know about children; I taught school in the country; and you've been so kind to me, sir, please may I be your Santa Claus!"

"You!" roared the surprised Mr. Lang; "have I been kind to you? Why, bless my soul, I didn't know it. Come, by all means, and my wife will be kind to you for the rest of your life; she'll make you a member of everything——"

"I haven't time, sir, thank you," interrupted Ivy. But the matter was settled about Santa Claus, and she put the last strokes on the baby's soft cheek with gentle, happy thoughts in her heart. Here was her chance to wish somebody a merry Christmas and for a single hour to live a life beyond her varnished negatives and pointed pencil.

II.

It was Christmas Eve and Ivy was at the Lilacs, the Lang's country seat in Westchester County, as deserving of its name now in its snow-covered whiteness as in blossoming sweet-scented June.

"You are neither fish, flesh nor fowl," said her hostess, as the maids heaped fur robes upon her, but some way failed to give her the real Santa Claus air. "Would you mind wearing Tom's rubber boots and his mask? I won't ask you to let me make you a beard out of the mattress hair, nor even a moustache, but will you not take this clay pipe between your teeth?"

Losing her shyness in this strange disguise, the guest consented gaily, and, when all was completed, waited up-stairs in breathless anxiety for the summons to appear among the children. As she stood alone, some one she had not before seen came along the wide hall and stopped, aghast. Ivy, who had many times retouched Eleanor's lovely face, recognized the girl directly, and was, herself, astonished when she heard her impulsive cry:

"Oh, Tom! Tom! You have come! You dear thing! I wasn't—really—mad at you! Of course, you had a right to go down to Coney Island last summer whenever you liked, but I am glad you give me a chance to explain why I wrote as I did! After the party, Tom, we can talk things over and——"

"Santa Claus! Santa Claus! Santa!" came a call from below, and in another minute lovers' quarrels were put aside for the mad misrule of Christmas Eve. Ivy announced herself as Mrs. Christmas, and was a pronounced success at once, as what fairy godmother could fail to be in such an atmosphere of dolls, skates, candy and lighted trees, plum cake and mistletoe? The revel lasted nearly an hour before Mr. Lang, calling all to order, made ready his camera and magnesium flash to catch the shadow of the best holiday ever kept at the "Lilacs." The children, used to being taken, posed at once, but before the flash illuminated the darkness in which they waited a noise was heard on the piazza outside, and a real man's voice said:

"Hello! Hello! Hello! Am I too late? Dunder and Blitzen got stones in their hoofs, and Prancer shied at a chimney swallow."

The heavy window sash was pushed open, and in a second Tom French, in his usual fur coat disguise, stood among the surprised children. All were present but Eleanor, who, not wishing to be in the group, had withdrawn into the dining-room, but she was not missed in the general excitement.

"Do I see double?" cried Tom, gazing at the grotesque figure of his substitute. "Am I sober? Am I twins? Has old St. Nick a doppel ganger? I say, Ned, am I out of focus? Am I two on a plate? Does nobody love me? Gooroo! Gooroo! Boohoo! Boohoo!"

It was an absurd situation, and while the little ones eagerly forgot their poses to gather up the fresh supply of toys and candy thrown on the floor, Mr. Lang struck a match and snapped his shutter. When he developed his plate he found Tom's figure upon it, but Ivy was not there. Carbutt's Eclipse plates are rapid, but no sensitometer can reckon how fast a woman's heart can beat, nor how fleet her motions when she acts on sudden motives. This was her chance to wish Eleanor a merry Christmas, this her opportunity to slip away, to efface herself as an ugly blot on the lovers' lives; to let the reconciliation begun in mistake be finished in earnest, and she was equal to the occasion. I cannot say she disappeared like little Golden Hair in the fairy tale and was seen no more forever, for any body can see her any day at —— Studio in Broadway, as she sits bent over her frame diligently retouching.

THE ACTION OF LIGHT ON SILVER CHLORIDE.

BY ROMYN HITCHCOCK.

A NEW method of investigating the action of light on the haloids of silver presented itself to my mind in the year 1885, but it is only recently that I have been able to test it in practice. The results of the first series of experiments, although not final as regards the quantitative composition of the haloid after the action of light, seem to me of sufficient interest to be made known at this time.

At the meeting of the American Association for the Advancement of Science, held this year at Toronto, I gave the results of these experiments. Since the time when Scheele proved that chlorine was set free by the action of light on silver chloride, more than a hundred years ago, experimenters have been striving

to go further than Scheele, and determine how the light acts and the composition of the decomposed haloid. But they have never been able to agree among themselves. Hence, in the absence of reliable quantitative results, we have various hypotheses or theories of photographic action, as the sub-chloride theory, which is perhaps the most favored; the metallic silver theory, the oxychloride theory, with its many variations, and what may be called the mechanical or dynamical hypothesis, according to which the molecules of the sensitive compound are supposed to be set in movement by the action of light, and this movement, in the case of the modern dry plates, is supposed to continue indefinitely.

The difficulty hitherto has been, that no person has been able to prove any of these notions directly. Silver subchloride has not yet been obtained in a pure state, and the subchloride obtained by chemical processes seems to have different properties from that obtained by the action of light.

It must also be considered that the product of the complete action of light upon a nearly pure haloid may be quite different from the product which constitutes the invisible photographic image obtained, perhaps, in a small fraction of a second. I do not commit myself to this view, and it is not my present purpose to add any speculations concerning it further than to say, that if the substance of the invisible image is not different from the compound resulting from the action of light on silver chloride alone, these experiments certainly do not strengthen the subchloride theory. My object is first to determine what the ultimate result of the action of light is; knowing this, we may then try to discover the intermediate products, if there are any, which is rather doubtful.

The object of the researches now begun is to determine :

First.—The action of light upon the haloid salts of silver.

Second.—The conditions which favor the decomposition of such compounds by light.

Third.—The products of the decomposition.

Fourth.—The activity of different parts of the spectrum in effecting the decomposition.

Much of this field has already been traversed by many experimenters, but a great deal of their work must be repeated in the light of the greater knowledge we now possess of photographic processes. Thus far I have succeeded in throwing new light upon the first division. Hitherto it has been a mooted question whether there is an appreciable loss in weight when silver chloride is exposed to light. That chlorine is set free has long been known, not only from the experiments of Scheele, already referred to, but from its odor, frequently noticed. Nevertheless, even one of the later and best-known experimenters, E. F. Von Bibra, declares that there is no appreciable loss in weight when silver chloride is exposed to sunlight for weeks in watch glasses and frequently stirred.* This result is confirmatory of many others, and leads to the remarkable conclusion that although chlorine is set free, there is no loss in weight. From other considerations, it has been assumed that a subchloride is formed by the action of light, while still other theorists deny the existence of a subchloride, and assume that metallic silver is formed. Either of these hypotheses requires that there should be a loss in weight.

To reconcile theory with observation, some authors have advanced the idea that an oxychloride is formed, and Hodgkinson attempted to separate the un-

* Journ. für Praktische Chemie, XII. (1874), 39-54.

changed chloride from that acted upon by the light, by dissolving the former in lithium chloride. The residue was very small, but by heating it in an exhausted tube the presence of oxygen was determined, though whether the compound was AgO , Ag , AgCl or Ag_3Cl_3 , Ag_2O , is uncertain.

Dr. Werner Schmid* has studied the action of light on plumbic iodide, and found that, while the pure dry iodide is not affected by light, the moist compound, in the presence of air, is slowly decomposed with the liberation of iodine and the formation of lead hyperoxide. It might be supposed that an oxidation of the silver could be effected in a similar manner, but this fact is not yet established. My own experiments show that in the case of silver chloride oxygen takes no part, although I am led to believe, as Seebeck has asserted, that water is necessary to the discoloration of the chloride by light.

The very interesting experiments of M. Carey Lea on the photo-salts of silver are regarded by him as strongly favoring the sub-chloride theory. His photo-chloride, for example, is presumed to be a mixture of the white chloride with from one to nine per cent. of Ag_2Cl . The latter is assumed to be taken up by the former very much as coloring matters are taken up in forming lakes. In other words, it has no definite chemical composition, but is only an intimate mixture in greatly varying proportions, the subsalt being protected from the action of reagents by the large proportion of normal chloride with which it is associated. Mr. Lea does not regard the latent photographic image as composed of the subsalt, but rather of the photo-salt—the mixture of normal and subsalt. The distinction is important, because the subsalt would ordinarily be decomposed by nitric acid, while the latent image is not destroyed by that acid. I most gladly express my great admiration for the very systematic and thorough manner in which Mr. Lea has conducted his investigations, but I cannot forbear to ask whether too much importance has not been attached to the action of nitric acid. Is there any conclusive evidence that part of the silver in the photo-salts is in the form of a sub-haloid? If we admit that a sub-chloride may be so intimately combined with the normal chloride as to be unaffected by nitric acid, why may we not quite as reasonably assume that metallic silver may be protected in the same way?

As regards Mr. Lea's photo-salts, I do not at the present moment recall any method of producing them which would be incompatible with the supposition that they contain metallic silver instead of the sub-haloid. On the other hand, there is very much in Mr. Lea's articles which is not to be readily explained upon any hypothesis yet advanced. The striking similarity of the effect of light and of sodium hypophosphite in producing positive and reversed impressions are worthy of further investigation for their elucidation, and the remarkable observations on "image transference," whereby it is shown that a salt of silver spread on paper and exposed to light under a negative becomes so changed that after treatment with chlorhydric acid the image may be developed upon the resulting silver chloride, indicate a more profound effect of light upon the molecular constitution of the compound than has hitherto been supposed. Other experiments of the same author show that the character of the chloride formed from a salt of silver which has been exposed to the light is different from the normal chloride, and one of the methods of forming the red photochloride is by treating such an exposed compound of silver with chlorhydric acid.

**Pogg. Ann.* 127, VII (1866), 493.

All this is at present inexplicable. If it could be shown that the action of light upon the original compound is to produce an infinitesimal quantity of metallic silver, we might base an explanation of image transference upon this fact, assuming that the metal would remain unchanged in the chloride afterwards formed. But here again we meet with a difficulty in the observation that the latent image is not destroyed by nitric acid. It is remarkable that the very minute quantity of silver compound changed by light should be so quickly affected by the developing solution and yet be insoluble in nitric acid. In the case of a sensitive photographic plate, the action of light can scarcely be more than superficial on the particles of sensitive haloid, and the protective action of masses is here not to be thought of. Some peculiar molecular combination or condition of the silver is indicated. If metallic silver were present, the results of my experiments show that it would dissolve in nitric acid. It certainly appears as though the molecules of the silver haloid were placed in a state of strain, not decomposed, remaining still Ag Cl , but having the bond of union between the atoms loosened, so that while nitric acid cannot remove the silver in the presence of the chlorine nor affect the molecules in any way, a developing solution can take up the chlorine and complete the action begun by the light. The silver is apparently changed in its chemical activity, its bonds weakened, not only for chlorine but for other elements or radicals. I do not put forward these views with confidence, for they are mere thoughts which have come to my mind in an effort to explain facts which are still very obscure.

Passing now to the consideration of the further action of light, in which the chlorine atom is set quite free, the only experimenter who has shown by accurate quantitative methods that silver chloride loses weight when exposed to light is Professor Spencer B. Newberry. He precipitated silver chloride, and kept the precipitate in suspension by means of a current of air passed through the liquid while exposed to sunlight. His results showed an appreciable loss in each experiment, but they do not agree well among themselves. Moreover, the loss was not determined from a single portion of chloride, but from separately weighed portions of silver nitrate in each experiment.

My own experiments were conducted upon a different plan. It had long seemed to me that the reason for the negative or discrepant results of investigators in this field was to be found in the merely superficial action of the light upon the particles of silver chloride. Professor Newberry partly succeeded, because he worked with a small quantity of chloride rather finely divided, but he did not reach a satisfactory result because his particles were not fine enough, and the longer his experiment was continued the larger would they become. Consequently the action of light ceased long before it had fully acted upon the entire quantity of chloride used in the experiment. It is also worthy of note, as confirming this view, that his resulting chloride yielded no silver to nitric acid.

In order to obtain the silver chloride in a very finely divided condition, I adopted a different method. Half a gram of silver nitrate was dissolved in about 600 or 700 c.c. of water, and precipitated with dilute chlorhydric acid in a room lighted only with gas. A number of rectangular slips of thin glass, such as are used for cover-glasses in mounting microscopical preparations, were placed at the bottom of a crystallizing jar, and held in place by a glass triangle and the milky fluid poured over them. The triangle was then removed and the jar set aside in a dark closet. The glass slips had been very carefully cleansed with

nitric acid, ammonia and distilled water, and accurately weighed, after standing several days in a desiccator over sulphuric acid.

After two weeks or more, the finely-divided precipitate had settled upon the glass slips as a thin, white film, and the supernatant liquid was drawn off with a siphon very slowly in order not to disturb the precipitate. The liquid cannot all be drawn off, for the precipitate would be washed from the glasses if at this stage the slips should be uncovered. The jar was then filled with distilled water, run in by a siphon, the lower end drawn to a fine point, and again set aside for a day or two. In this manner the chloride was repeatedly washed, and finally the last wash-water was drawn off as completely as possible, the precipitate by this time having become somewhat attached to the slips, and the jar set aside uncovered to allow the slips to dry spontaneously in the air. They were then picked out with forceps and placed in the desiccator over sulphuric acid for several days and then accurately weighed. Throughout these experiments all weights were verified on different days at least twice, more frequently three times.

The thin films thus obtained were quite transparent. Fine print could be read through them with ease. It was therefore supposed that sunlight would act throughout the particles of each film, and consequently that they would afford a means of determining the character and extent of that action. It was desirable not only to weigh the slips after exposure to light in order to determine if there was a loss of weight, but also to collect and weigh the chlorine set free. To this end four of the coated slips were placed end to end in a wide glass tube, one end of which was attached to a hydrogen apparatus and the other drawn out and connected with bulbed U tubes containing a solution of silver nitrate. The hydrogen was generated from zinc and sulphuric acid and passed through a solution of silver nitrate. The apparatus was set out in direct sunlight on the roof of the United States National Museum, the U tubes being protected by an envelope of black paper, and a slow current of hydrogen was allowed to pass through. The exposure lasted from 11.15 A. M. to 4.15 P. M., August 19th.

The glass slips were then placed in the desiccator and weighed after several days. The large tube and U tubes were washed out into a beaker, the precipitate collected in a porcelain crucible, heated to incipient fusion and weighed. From this the amount of chlorine set free was calculated to be 0.004 grams.

Crucible+Ag Cl.....	4.0143
Crucible.....	3.9982
Ag Cl.....	0.0161

The results of the weighings of the glass slips are given in Table I.

TABLE I.

	Slips.	Slips+Ag Cl.	Wt. of Ag Cl.	Wt. after expos.	Loss=Cl.
No. 2.....	.49575	.51870	.02295	.51775	.00095
No. 4.....	.45503	.48350	.02787	.48225	.00125
No. 5.....	.49955	.52405	.02450	.52285	.00120
No. 6.....	.44163	.46575	.02412	.46460	.00115
The total loss of chlorine.....				0.0045 grams.	
Chlorine collected as above.....				0.0040	"

Slips 1 and 7 were imperfectly covered and were not used, therefore they are omitted from the table. Slips 3 and 8 were placed under a beaker cover and exposed for two days to bright sunlight, with the result shown in Table II.

TABLE II.

	Slips.	Slips+Ag Cl.	Wt. of Ag Cl.	Wt. after expos.	Loss=Cl.
No. 3.....	.4584	.4742	.0158*	.47325	.00095
No. 8.....	.3308	.3537	.0229	.35230	.00140

Reducing the results in Tables I and II to show the loss of 0.100 grams of Ag Cl., and adding the results of Professor Newberry's experiments for comparison, we have the following:

CALCULATED LOSS IN WEIGHT OF 0.1 GRAM Ag Cl.

	Hitchcock.	Newberry.
No. 2.....	.00418	.0030
No. 4.....	.00448	.0018
No. 5.....	.00490	.0027
No. 6.....	.00485	.0015
No. 3.....	.00600	
No. 8.....	.00620	

If we consider the significance of these figures, it is obvious that there is a very considerable loss in weight when silver chloride darkens in sunlight. This is a fact now established beyond all question, not only by the results here given but by others not recorded.

2. The second important point is that the loss in weight is equal to the weight of chlorine collected within the limits of experimental error. This conclusion is fatal to the oxychloride hypothesis, and proves that the light acts only by setting chlorine free.

3. The results of the two sets of experiments are quite uniform among themselves; but it is obvious that in the first set of four slips, which were exposed during one day only, the light had not acted to its full extent. Whether the two slips exposed for two days represent the full action of the light remains to be shown by future experiments.

4. There is still another interesting result from these experiments. The universal opinion is that silver chloride darkened by light yields no silver to nitric acid. Some authors say very little can be extracted by long digestion. The thin films used in these experiments yield an abundance of silver to dilute nitric acid. Whether nitric acid dissolves all the metallic silver in the films has not yet been determined. The fact of the protective action against nitric acid of relatively large quantities of unchanged chloride in other experiments is clearly shown by the amount of silver dissolved by the acid out of these films.

As evidence that the thinness and evenness of these films greatly influence the result, I may mention that in my first trial of this method on April 2d I used slips on which the chloride weighed from 0.050 to 0.070 gram. With such comparatively thick films the results were not uniform, but they were very much like those of Professor Newberry, varying from 0.0011 to 0.0023 for 0.1 gram of chloride.

I regret that these experiments are so incomplete, but, as already said, I am induced to publish the results at this time because of their important bearing upon the theory of photography, and because it is very difficult for me to carry on investigations of this kind as I am at present situated. Consequently it may

* This slip was only about two-thirds covered with Ag Cl.

be several months before I shall be able to resume uninterrupted work in this direction, but it is my intention to extend the research as soon as possible.

Meanwhile I would express my indebtedness to Professor F. W. Clarke and to Dr. Carl Barus for the use of the laboratory and apparatus of the United States Geological Survey, in which these investigations were conducted.

U. S. NATIONAL MUSEUM, Washington, D. C.

CHEMISTRY OF CHROMIUM AND ITS SALTS, AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(Continued.)

CHROMATES.

THE normal alkaline chromates are yellow; the acid chromates are red.

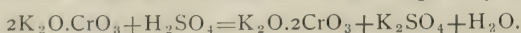
The chromates of the alkalis, those of calcium, magnesium, nickel, copper, etc., are soluble in water. The chromates of barium, zinc, cadmium, lead, mercury, silver and most of the basic chromates are insoluble.

The soluble chromates give yellow precipitates with the salts of lead, zinc and bismuth, and red with the salts of mercury, and reddish brown with those of silver.

All the acids transform the alkaline chromates into dichromates. They are decomposed by hydrochloric acid as explained above and reduced to sesquioxide by sulphur dioxide, hydrogen sulphide, and many organic substances, as sugar, alcohol.

Potassium chromate, $K_2O, CrO_3 = K_2CrO_4$. This salt is made by calcining chrome-iron ore with potassium carbonate in a reverberatory furnace. It is soluble in 2 parts of water at 15.5 degrees C.; by evaporation the solution deposits yellow rhomboidal crystals.

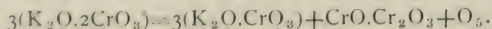
Potassium dichromate, $K_2O.2CrO_3 = K_2Cr_2O_7$, is prepared by treating a concentrated solution of the normal salt with a small quantity of sulphuric acid.



It is unalterable in the air. At a high temperature it loses half of its oxygen and is converted into normal chromate and chromic oxide.

It crystallizes without water of crystallization in dark red orange prisms, insoluble in alcohol and soluble in ten parts of cold water, to which it imparts a strong acid reaction.

Its action on organic substances under the luminous influence is similar to that of chromic acid, being decomposed with formation of chromous chromate, thus:

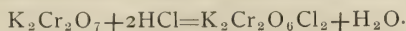


Potassium dichromate serves for the preparation of the other salts of chromium. In the arts it is employed as an oxidizing agent for bleaching sperm oil, feathers, etc. However, for certain goods—feathers, for example—it has been superseded by hydrogen dioxide rendered alkaline by a small quantity of ammonia.

Ammonium dichromate $(NH_4)_2Cr_2O_7$, is analogous to the potassic salt. It is more easily reduced by light.

Concentrated sulphuric acid and nitric acid added to a solution of the potassic or ammoniac dichromate set free chromic acid.

Hydrochloric acid moderately heated forms a chloro-chromate :



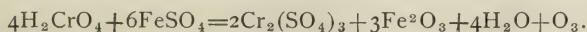
In small quantities hydrogen sulphide forms a chromate and chromic hydrate while sulphur is deposited:



In large quantities chromic hydrate and potassic sulph-hydrate are formed:

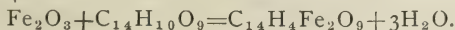


Next to the silver salts the above dichromates are the most useful salts employed in photography. Photo-lithography, photo-etching, and certain photo-engraving processes are based on the insolubility of gum arabic, albumen, or gelatine containing dichromates, after exposure to light or on the more or less permeability of the latter organic substance. These changes in the physical properties of the substances were first attributed to their oxidation by the oxygen absorbed during the reduction of the chromic salt ; but from the fact that oxidation generally tends to destroy organic matters or to increase their solubility during the preliminary changes occurring in their chemical constitution, it is more likely, as shown by Mr. J. W. Swan, that it is due to a combination of the substance with the products of the deoxidation of the potassic dichromate. Moreover, Dr. Eder, in his researches on the action of chromic acid on organic matters, has ascertained that the photo-image after exposure consists of chromous chromate, $\text{CrO} \cdot \text{Cr}_2\text{O}_3$, and this sustains the theory of Mr. Swan. However, it should be observed that the photo-image by prolonged immersion in water consists of chromic oxide only, and therefore that the insolubility must be the result of the presence of this oxide. It is well known that ferric oxide acts in a similar manner, thus : a gelatine film imbued with chromic acid, then treated with ferrous sulphate, becomes insoluble in warm water from formation of ferric hydrate.*



On the same actions are based the carbon and dusting processes. In the former process the chromic oxide acting as a mordant permits the obtaining of various colors, as with dyes: alizarine, purpurine, coralline, indigo, logwood, etc. (Persoz.)†

The dichromates are also employed to print from negatives without silver salts ; thus a sheet of paper—superficially sized with starch or gelatine—is floated on a strong solution of potassic or ammoniac dichromate, dried, exposed to light, and for half an hour washed in rain water, three times renewed, to completely eliminate the dichromate not altered ; when the print is floated on a solution of ferrous sulphate this is changed to ferric oxide, the latter forming colored precipitates with reagents. Tannic acid with ammonium carbonate gives a black bordering on violet:‡



Lead chromate, PbCrO_4 , is the yellow precipitate formed by mixing a solution of normal potassic chromate with a solution of lead nitrate. If the dichromate is employed the product is canary-yellow.

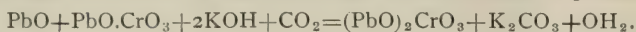
* See the memoir of Dr. J. M. Eder, "Les réactions de l'acide chromiques et des chromates sur les substances organiques dans leurs rapports avec la chromo-photographie." Vienne, 1878. Translated in the *British Journal of Photography*, vols. XXV and XXVI, and in Anthony's *Photographic BULLETIN*, vols. X and XI.

† Consult "Upon Weakening, Intensifying, and Toning Carbon Tissues," by Carl von Stefanowsky.—*British Journal of Photography*, vol. xxiv, pp. 223 and 237.

‡ J. Sella's process. *La Lumière*, 1857. Translated in *Humphrey's Journal*, vol. ix, p. 97.

Lead chromate constitutes the chrome yellow of painters. It dissolves in the alkalis and in hot concentrated hydrochloric or sulphuric acid. It is transformed into an orange red basic chromate by boiling with lime water.

A basic red chromate, $(\text{PbO})_2\text{CrO}_3$, is formed by passing a current of carbon dioxide through a solution of lead oxide and lead chromate in potassa:

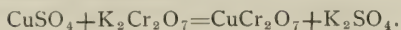


All these compounds are employed in calico printing, glass and porcelain painting, in dyeing, etc.

Lead chromate is easily fixed on textiles by alternately dipping the material into a solution of lead nitrate, then into a solution of potassic chromate. The red orange color is obtained by dipping the dyed material into boiling lime water.

Uranium chromate is yellow-brown. It is obtained by precipitating uranous chloride by potassium chromate. It consists of several chromates of uranium.

Copper dichromate, $\text{CuO} \cdot 2\text{CrO}_3 = \text{CuCr}_2\text{O}_7$, is obtained as a green mass by evaporating a solution of this salt obtained by mixing a solution of cupric sulphate with one of potassic dichromate.



Under the action of light and necessarily in presence of an organic substance, it is transformed into copper chromite:



Mr. C. J. Burnett's cuprotype is an application of this photo-chemical action. The paper, prepared with a solution of copper dichromate with gelatine or grape sugar, or both, is exposed, washed in rain-water—any water containing neither lime or iron—then developed with potassic ferrocyanide. The image is purple red, from formation of cupric ferrocyanide, and can be toned black by treating it after the potassic ferrocyanide has been washed out, with a solution of ferrous sulphate, or tannin, gallic acid, or pyrogallol with an alkaline carbonate.*

(To be continued.)

DARKENED SILVER CHLORIDE NOT AN OXYCHLORIDE.†

BY M. CAREY LEA.

ABOUT two years ago, I published a series of papers in this Journal, the main object of which may be briefly stated as follows: To prove that the substances which I described as "photosalts" and obtained by purely chemical means were identical with those produced by light, with both the visibly darkened substances, and the material of the latent image. Further, that all these substances consisted of a silver haloid (normal chloride, bromide or iodide) combined with the corresponding subsalt, not in equivalent proportions, but after the manner of a "lake." The subsalts, being unstable substances when isolated, acquiring much greater stability by the union.

The only objections I have seen to these views were based on investigations made in England by Dr. Hodgkinson; his conclusions were that an oxysalt and not a subsalt was formed. Although several years have elapsed since these con-

* Burnett on Sella's ink process. *Photographic Notes*, 1857. Reprinted in *Humphrey's Journal*, vol. ix, p. 105 (a very interesting communication). See also the *Chromatype*, in Robert Hunt's "Photography," American Edition, p. 129. New York, 1852. S. D. Humphrey.

† From sheets of *American Journal of Science* kindly sent by the author.

clusions were made public, the means by which they were reached and the necessary experimental proof, do not seem to have been published. Mr. Meldola, in his interesting "Chemistry of Photography," in treating of this part of the subject seems disposed to accept Dr. Hodgkinson's theory and his formula Ag_4OCl_2 for darkened silver chloride. Mr. Meldola adopts my views that the photosalts which I described and which were obtained by purely chemical means are identical with the products resulting from the action of light on the silver haloids, but expresses the opinion that I have not proved my theory of their constitution.

It has always seemed to me that the whole mass of observation on the action of light on silver chloride tended so thoroughly to indicate the formation of subchloride, that we might reasonably accept that view, at least until something in the way of proof were offered for the oxychloride theory. But, waiving this objection, I will endeavor to show that subchloride and not oxychloride is the product of the action of light on silver chloride.

The question as to the presence or absence of oxygen in colored silver chloride is one that cannot be determined satisfactorily by quantitative analysis. Taking for example the formula just mentioned, Ag_4OCl_2 , it would involve the presence of about 3 per cent. of oxygen, if the entire mass of silver chloride were converted into this substance. But we know that even by the longest exposure, the proportion of AgCl acted upon is very small. It would probably be a liberal estimate if we were to fix 5 per cent. of the whole mass as the proportion changed by light. So that the amount of oxygen that would, according to the oxychloride theory, be introduced into a given quantity of chloride by prolonged exposure would not exceed three-twentieths, or 0.15 of 1 per cent. of the material under examination, a dangerously small quantity on which to attempt to decide an important question, especially where the estimation is indirect. If even a very careful determination of the silver and the chlorine present should bring the sum of these to a quantity represented by figures amounting to from 99.80 to 99.90, would it be allowable to assume that the difference between this and 100 consisted of oxygen, and so to take the presence of an oxychloride as proved? Such reasoning could not be accepted; the errors incident to the most careful analysis would too largely affect the point vitally at issue, not to speak of the entire absence of proof that the deficient quantity was oxygen.

These considerations convinced me that it was not in that direction that one should seek for proof of the presence or absence of oxygen in the substance in question. I therefore looked for what may be called proof by exclusion.

Coal naphtha (refined petroleum) is a substance absolutely free from suspicion of containing oxygen or moisture as impurities, so much so as to be universally used for the preservation of sodium. I have sodium that has been preserved in this way for over thirty years. Silver chloride was precipitated with excess of hydrochloric acid, was washed in a darkened room and dried in a dessicator. From this it was transferred to a porcelain crucible, covered and fused over a lamp. When thoroughly fused (in this condition it is as fluid as water) it was poured directly into naphtha. This naphtha had been placed to the depth of an inch or more in a dry porcelain vessel, which was first well wiped out with naphtha to remove the film of atmospheric moisture which condenses on surfaces.

The chloride congealed into a pale gray lump which, whilst it remained under the petroleum, was absolutely free from all possibility of contact with oxygen,

free or combined. Without removing it, the vessel was moved into the sunshine. When touched by sunlight, the chloride instantly became as black as ink.

This experiment seems decisive as to the oxychloride theory.

It seemed desirable not to stop here, but to find a means of applying an equally decisive proof by exclusion to the converse case. In the above instance, a photosalt was formed by reduction, starting with normal chloride. The converse case would be the formation of a photosalt by chlorination, starting with metallic silver, and excluding oxygen, free or combined, thus demonstrating that that element is not needed and plays no necessary part in the formation of silver photochloride.

(To be continued.)

OUR ILLUSTRATION.

THE excellent instantaneous shot, by Johnson, the well-known New York photographer, that forms the frontispiece of the present issue of the BULLETIN, is a view of the yacht "Nymph," taken during the Corinthian races of the Seawanaka Yacht Club, July and August, 1889. It is one of those interesting situations that are full of action and which form such striking pictures upon the water. The handsome little boat is one of the best of her kind, and is, of course, a great source of pleasure to her owner and his friends.

THE DAGUERRE FUND.

SUBSCRIPTIONS to the above fund are coming in, but if we are to give a good account to President McMichael in January, our friends should make up their minds very soon. We will send a regular official receipt for every dollar sent to the editors of the BULLETIN. Send the subscriptions early, and let us have a response that will insure the completion of the best design submitted by the artists. One dollar is not very much with which to honor a man who has given us a new art. This small amount of interest in the proposed monument will always be a source of satisfaction to every contributor. Send your subscriptions to the editors of the BULLETIN at 591 Broadway, New York.

PHOTOGRAPHING THE ECLIPSE OF THE SUN.

As we go to press, the following dispatch comes to hand from the United States expedition in Africa :

WEST COAST OF AFRICA,
ST. PAUL DE LOANDA, December 24th.

The eclipse of the sun was observed with partial success yesterday.

The sky was clear during the first part of the eclipse, but was obscured during totality.

The results obtained through the forty-foot photoheliograph, managed by Bigelow, were entirely successful. They will enable us to give accurate corrections of the position of the moon relative to the sun.

Seventy pictures were taken before and forty after totality.

There was no hitch in the working of the apparatus.

With extra photographic appliances and assistance we could easily have obtained 1,500 pictures.

Different phases of the clouds were recorded with success.

The object of these exhibitions is to afford an opportunity for all interested to compare the best work of the year of members and other local amateurs. Such exhibitions tend to raise the standard of work of all concerned. Judging from indications, the interest in amateur photography is very much increased, even among those who have not tried to practice it.

There was a good attendance upon the exhibition throughout the week.

The following report from the Lowell *Sunday Critic* gives a correct detailed report of the exhibition.

THE FIRST ANNUAL EXHIBITION OF THE LOWELL AMATEURS.

THE exhibition of the Lowell Camera Club, which has been shown during the past week at Morrill's studio, has certainly been one which not only reflects much credit on the individual exhibitors, but also augurs most auspiciously for the future of the delightful pastime of amateur photography in Lowell. Time has been, in the not yet very dim past, when good results, with the best materials to be had for amateur work, have been quite as often accidents as calculated results. The condition of the amateur in this respect has been much improved during the last few years, and now that the days of experimental apparatus are practically days of the past, the amateur who has always believed in his art is beginning to show visible reasons for the faith that has been in him through all adversity. The exhibition of the past week is the first that the present organization has made, and notwithstanding the experience of many of the exhibitors antedates the beginning of the present club, it is one of which the camera club may well be proud.

Beginning on the left of the gallery, the club shows the results of its first annual field day by twenty-eight views, which are the work of seven gentlemen. There are four subjects treated—Beaver Brook, the old dam on Richardson's Brook, a cattle subject and a club group, each with some especial motive. It is in this classified collection of work that a most interesting opportunity is afforded to study the individual taste and skill of executions.

Mr. W. P. Rundlett exhibited two frames of shore views, including subjects from Gloucester, Rockport and Thach's Island. Mr. Rundlett is an old hand with the camera, and the result of his long experience is fully shown by the artistic selection and grouping of his

pictures and the fine feeling for the picturesque which they display throughout. One subject, which appeared on the catalogue as "Fishing Boats," showed an exquisite grouping and massing of light and shade.

Frank B. Murphy's frame showed a collection of miscellaneous work, including architectural, landscape and copy work. Mr. Murphy is one of the club of more limited experience in the art than many others, and his work shows good promises of success.

Allen C. Sargent, of Graniteville, was represented by a number of pieces which showed a variety of subjects. The marked quality of this work is its good developing.

Albert S. Guild is one of the oldest in experience of all the exhibitors, being one of the original members of the Lowell Amateurs, the society from which the camera club grew. Mr. Guild's exhibit was one of the most unique and pleasing that was shown, consisting of a group of bromide prints of scenes about Lake George. The handling of the difficult process of bromide printing was most successfully accomplished in this work, and a delightful delicacy and softness were attained. The artistic arrangement of the pictures added not a little to its attractiveness.

Mr. George E. Lull is also one of the more experienced members of the club, his connection with the amateur societies of the city dating back to about 1882. Mr. Lull's exhibit consisted of a frame of Moosehead Lake views, the result of a vacation trip to that locality. Mr. Lull is one who pursues his favorite pastime in its most attractive form, spending his vacation with canoe and camera, and thoroughly exhausting the natural beauties of the scenery where he happens to pitch his tent. In addition to the delightful photographic work, which results from his vacation trips, many of his series of pictures are supplemented by texts, which his brother, Mr. H. W. Lull, of Milford, prepares, thus completing a perfect reminiscence of the scenes visited.

Mr. William P. Atwood, the President of the club, hung six landscapes. Apart from the general excellence of the work, the object of particular interest in this exhibit was its success in the difficult operation of printing in clouds. It is rare that the out-door photographer is fortunate enough to get good landscape and good sky on the same plate, and it is to remedy this fault of nature that the process of printing in has been devised. The resulting picture is made from two or more plates, one being used for the landscape and

the others for the clouds. The operation is exceedingly delicate and requires the utmost care and patience for its successful accomplishment.

The exhibit of Mr. M. A. Taylor had for its center piece a peculiar experiment somewhat in the line of Mr. Atwood's work. In this view two small plates were used for the landscape and an additional one for the sky, so that the finished print was the result of three exposures. This frame also contained good samples of portrait work and a wonderfully clear cut flash-light picture of a Night-Blooming Cereus.

(To be continued.)

TORONTO AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE first annual meeting of the above association was held in their new quarters in the College of Physicians and Surgeons, on Monday evening, November 4th.

The *President*, Mr. G. S. C. BETHUNE, occupied the chair.

The *Treasurer*, Mr. FRANK D. MANCHEE, reported that, notwithstanding the heavy expense entailed in fitting up their present premises, there was still a balance to the credit of the association.

The President's report of the year's work proved conclusively that the enthusiasm among the members was steadily increasing, and that the efforts of the officers had evidently been appreciated by all.

During the winter months three practical demonstrations were given as follows: Mr. J. S. Ramsay on "Production of Lantern Slides by Reduction with Artificial Light;" Mr. W. A. Lyon on "Sensitized Paper and Printing Methods;" Mr. Milburn, demonstrator for the Eastman Dry Plate and Film Co., on "Stripping Films," showing clearly how easily it is done when one knows how.

On May 18th, through the kind invitation of the *Vice-President*, Mr. W. B. McMurrich, an excursion was made to DeGrasse Point, Lake Simcoe, where a couple of days were most enjoyably spent under canvas, and a large number of negatives taken.

The first "At Home" of the association was held on the 18th September, at which nearly two hundred guests were present. A very pleasant evening was spent. Some fine musical selections were admirably rendered, and a lime light exhibition of lantern slides given principally from members' negatives.

After the above reports had been received, some twenty names were then proposed, and the following officers elected for the seasons of 1889-90: *President*, W. BARCLAY McMURRICH; *Vice-President*, FRANK D. MANCHEE; *Secretary-Treasurer*, E. HAVELOCK WALSH. *Executive Committee*: G. S. C. Bethune, Dr. Ellis, Rupert Muntz, Hugh Neilson, D. W. Cameron, A. E. Trow, T. Langton, George McMurrich.

THE first weekly meeting of the Association for the season of 1889-90 was held in their rooms, College of Physicians and Surgeons, on Monday evening, November 18th, at 8 P. M.

The *President*, Mr. W. B. McMURRICH, in the chair.

The President, in his opening address, thanked the large numbers present for coming out in such unpropitious weather, and heartily welcomed those who had accepted the invitation extended to them by the officers of the Association, and hoped they would be repaid to some extent for the interest they had shown in amateur photography. He also informed them of the intention of the Association to give practical demonstration during the winter in all branches of the art. Mr. Neilson had kindly consented to give the first of the series, taking for his subject the making of lantern slides. The President then introduced Mr. Neilson, who gave a short address on the lantern, stating that it was not a modern invention as a great many supposed, but had been in use some two hundred years ago. Before proceeding to the actual lantern slide making, he produced for inspection a simple but unique apparatus, designed by himself, for the reduction of negatives of any dimensions to the size of lantern plates which could be used for artificial light or by day. The former process he did not recommend, owing to the extreme difficulty of getting the negative properly illuminated by lamp or lantern, as he considered it would be necessary to stop down the lens to get a fairly good reduction, and that would necessitate an exposure of at least one-half to three quarters of an hour. The process of reduction by day was much more simple and easy, as it would take only a few seconds' exposure on an ordinarily bright day to get a good slide, consequently he advocated the latter mode as being by far the more satisfactory of the two. Contact printing was the next best method, providing the negative was not bigger than a one-quarter plate. Mr. Neilson here gave a practical demonstration.

Taking a very dense negative, he gave it thirty seconds' exposure about 15 inches distant from an ordinary gas jet, and developing with the well-known ferrous-oxalate solution, the slide turning out to be an excellent one. Mr. Neilson then explained how they were matted and bound, finishing some he had brought with him for that purpose.

The next feature of the evening's entertainment was a lantern slide exhibition by the Secretary, who put through a series of views descriptive of the recent outing of the Association on Thanksgiving Day, which proved a source of amusement to all present. The above views were taken with detective cameras, manipulated by Messrs. H. Neilson, J. G. Ramsay and E. H. Walsh. After this a collection of excellent landscape and marine views, groups, etc., were shown. These last were taken with tripod cameras by Hon. A. M. Ross, W. B. McMurrich, George McMurrich and a few other members. These subjects had been carefully chosen, as some of them were by far the best slides shown this year in the Association.

This ended one of the most enjoyable evenings yet spent in the rooms, and it is to be hoped is only a precursor of what is to follow.

E. HAVELOCK WALSH,
Secretary-Treasurer.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the society was held on Wednesday evening, December 4, 1889, with the *President*, Mr. FREDERICK GRAFF, in the chair.

The Committee on Lantern Slides reported that at the November Conversation Meeting the first set of slides from the American Interchange for 1889-90 was shown, being those of the Society of Amateur Photographers of New York. About seventy-five slides were shown, the general standard being high and showing an improvement over last year. Slides were also brought for exhibition by Messrs. George B. Wood, Dr. C. L. Mitchell, F. H. Rosengarten and others.

The Committee on Membership reported the election to active membership of Mr. George M. Taylor and John Kearsley Mitchell.

The Executive Committee announced the opening of the exhibition of pictures contributed by members of the society, from which the four "Honor Pictures" for the year would be selected. The pictures were hung on the walls of the meeting-room, where

they would remain until the annual meeting in January. During the month members would deposit votes designating their choice of the pictures in a box prepared for the purpose, and the result would be announced at the January meeting.

Nominations for officers and committees for 1890 were made.

A paper was read by Mr. Theodore H. Luders, "On Development with Pyrogallie Acid in connection with Ammonia in Vapor."

Mr. Morris Earle showed some novelties in photographic apparatus, which he had collected during a trip to England and the Paris Exhibition. Among them were some trays made of thick waterproof paper for developing, and other processes in photography. When not in use, by loosening metal clips at the corners the trays could be opened out into flat sheets, rendering them extremely portable. A small and exceedingly portable achromatic focusing glass made by R. & J. Beck, was shown, also a neat leather case in which to keep or carry a lens with safety. Mr. Earle described a carrying case for film negatives to be attached to the back of a camera after the manner of a roll holder. The position of the films was changed by inserting the hand through a bag or sleeve. He also described a panoramic view camera which he had seen in Paris. A film or paper negative was used, being bent into a semicircle with the lens in the center. By a lever on top of the camera the lens could be revolved so as to cover different portions of the plate successfully. The light was admitted to the lens (which was of fixed focus) through diaphragm in front in the form of a perpendicular slit, the opening revolving with the lens as it was turned. A unique feature possessed by the camera was the fact that if in one portion of the view dark objects predominated, requiring long exposure, the lens could be allowed to cover that portion of the view for a greater time, and less exposure be given to the brighter parts of the view, simply by properly manipulating the lever attached to the lens.

Prints from negatives made by the camera had been seen by Mr. Rau, Dr. Mitchell and others, who corroborated Mr. Earle's account of their remarkable qualities.

Mr. John G. Bullock called attention to the late explosion of flash-powder in this city, with its terrible result in the death of three persons. The details were no doubt familiar to the members present, but as the photographic world at large may not have heard of it, he thought it right that the published min-

utes of the society should caution all to look with distrust upon flash-powders of a yellow color, and if they prove upon examination to contain picric acid along with powdered magnesium, to consider them highly dangerous. Picric acid upon standing in mixture with powdered magnesium for a length of time is supposed to form picrate of magnesium, a highly unstable combination more dangerous than dynamite. A person finding a vial of such flash-powder in his possession had best dispose of it at once, but with great care. He is advised against pouring water upon it or burning it, but rather to throw the whole vial into a river or down some gorge, where it would be scattered without doing harm. The very act of removing the cork from the bottle might be attended with serious results. The danger of picric acid flash-powders increases with age.

Dr. Mitchell fully agreed with Mr. Bullock, and considered all flash-powders, except those composed of pure magnesium, more or less dangerous, differing only in degree. Magnesium has a tendency to absorb moisture, in which state it readily combines with picric acid, forming the dangerous picrate of magnesium. Even a single ounce of such powder would be exceedingly dangerous.

On motion of Mr. Wood, Mr. Bullock and Dr. Mitchell were requested to prepare a paper for the next meeting on the subject of flash-powders.

Mr. Rosengarten called attention to a method of preparing ground glass for focusing screens by the use of hydrofluoric acid in combination with carbonate of soda.

Dr. Wallace spoke of the use of a solution of plain boiled starch spread upon a plate of glass, and allowed to dry, thus forming a very fine surface for a focusing screen.

Mr. Wood described a method of focusing without the use of any screen. If the position to be occupied by the plate is determined by a metal strip located in the usual position of the ground glass, by placing a focusing glass against this strip it will show (over a limited area, of course) the image usually projected on the screen, and a proper focus can thus be readily obtained. A piece of plain glass can also be used in this manner as a support against which to place the focusing glass.

Dr. Mitchell asked the experience of members in regard to films, stating that he had found some rolls to be very good, and others not. He had noticed markings like long transparent lines as though scratched with a needle.

Mr. Luders suggested that they may have been damaged in unpacking.

Mr. Wood stated that he had lately returned from a trip of over a thousand miles on which he had used films, and his feeling was that hereafter he preferred the weight of glass to the uncertainty of films. He thought nothing had yet been discovered to equal the perfect surface of glass and the certainty of its results.

Adjourned.

ROBERT S. REDFIELD,
Secretary.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

REGULAR MEETING, DECEMBER 3, 1889.

President NEWTON in the chair. The *Secretary* announced the titles of journals and papers received for the section, since its last meeting, for which the usual vote of thanks was tendered.

The Executive Committee announced that an informal meeting of the section would be held in the Trustees' room of the Institute, December 18th, at 8 o'clock P.M., to which all interested in photography were cordially invited.

The Committee also announced that the subject of the evening was "A Lantern Exhibition of Scenes in Scotland and the Hebrides, by Professor Randall Spaulding," and results of experiments with eikonogen, by H. J. Newton. Mr. Newton then said:

Ladies and Gentlemen.—At the last regular meeting I briefly alluded to the popular excitement about a new developer called eikonogen. My position was not well defined, because I appropriated but a few moments to answer a question which was continually being asked me, "had I tried eikonogen?"

I thought to save time by answering all at once. I am now convinced that no time was saved, as much comment has been caused by the position I then took, and as a consequence I feel it my duty to more fully explain the reasons for expressing myself as I did.

A given formula does not produce uniform results when used by different persons; this fact, however, will hardly account satisfactorily for the results obtained by me with eikonogen. My effort was to discover its real and comparative merits. The plates I used were mostly Carbutt's eclipse sensitometer mark 27, and my comparison was with hydroquinone, and the alkalies carbonate of soda and caustic soda, separate and together. A specific developer will not produce the same results on plates of different manufacture. It

is presumable that the printed formula accompanying a package of plates is the best compound for that manufacture. I used one make of plates last summer which would produce yellow negatives when developed with caustic soda and hydroquinone, and especially was this the case if the exposure made it necessary to prolong the development. I also had one make of films which, with this developer, gave deep lemon-colored negatives, but both of these yielded white negatives when caustic barium was used instead of caustic soda. This yellow fog can be removed by immersing the negative in a weak solution of perchloride of iron, and sometimes by immersion in iodide of mercury when the fog is slight. Some of these yellow negatives are good printers.

I commenced my experiments with carbonate of soda, 5 grains; eikonogen, 3 grains; water 1 ounce; the same was used with the hydroquinone, substituting it in place of eikonogen. I omitted sulphite of soda because I proposed to determine the comparative merits in and of themselves of these two substances in development of the latent image. The use of sulphite would prevent this, because the action of sulphite with eikonogen is very different from what it is with hydroquinone. With this last named it acts as a powerful restrainer; with eikonogen there is no such effect.

Hydroquinone has had the reputation of being a slow developer. This has been due entirely, in my opinion, to the ignorance of the fact that its action was restrained by the sulphite, which has always been a conspicuous constituent of all the published formulas for hydroquinone developers. With water, 1 ounce; caustic soda, 3 grains; hydroquinone, 3 grains; the exposed plate was fully developed in twenty seconds; a plate with the same length of exposure, developed with the same compound, substituting eikonogen for hydroquinone, the time required was just six times as long, that is, one hundred and twenty seconds, and with this long time it was not as strong a negative as the one developed with hydroquinone.

It will probably be noticed that I have omitted the addition of hypo in the process of development with eikonogen. The reason for this is that, in my opinion, it is not good for anything without that addition and it is not of much practical value with it.

With the carbonate developer the eikonogen started slightly quicker than the hydroquinone, but the development was not completed any sooner than the other. With six grains of

eikonogen the start to develop was still quicker, but like a balky horse that would not go without the lash, which in this means hypo, which I did not supply, because I was trying it against hydroquinone which did not need it; perhaps it would be a great addition to that also—who knows? The addition to the caustic soda developer mentioned, of three grains to the ounce of sulphite of soda, more than doubled the time of development of the hydroquinone, namely fifty-five seconds, but made no perceptible difference with the eikonogen. Two grains to the ounce of this developer of bisulphite of potash retarded the hydroquinone about the same as the 3 grains of sulphite did, but had no perceptible effect on the eikonogen. Ten grains of sulphite to the ounce exerted no retarding effect on the eikonogen developer, but rather accelerated it, while with the hydroquinone about three times as long was required as when no sulphite was used, but still nearly three times as quick as with eikonogen. With this quantity of sulphite in this formula a dozen plates can be successfully developed.

In my experiments with this compound I used 4 grains each of eikonogen and hydroquinone. Bromide does not act as a restrainer in a caustic soda developer with hydroquinone. I sometimes introduce from 2 to 4 grains to the ounce of bromide of soda to give additional clearness to the negative or positive, 10 or even 20 grains of this bromide would make no perceptible difference in time of development, but give additional beauty to the negative. The proper restrainer for a hydroquinone and caustic alkali developer is hydroxylamine; 1 grain to the ounce is all that can be safely used in conjunction with the ordinary large quantity of sulphite. I have made many more experiments with these two developers, which in a general way are covered by those already stated, except, perhaps the fact that after using these developers, as mentioned, I mixed the two together, and trying them so mixed on a plate exposed the same time as the others, I always obtained better results than with the eikonogen alone. So far any one who wants to use eikonogen I give the formula I gave at the last meeting, combining the two. I compounded it something after the methods recommended in the article which I wrote for the "International Annual" for 1888. With caustic barium saturated solution, 10 grains of sulphite to the ounce, and 4 grains of hydroquinone, I have produced beautiful negatives on Carbutt B plates with instantaneous exposure, and lantern

slides with dim light on same plates when exposed two minutes, when in the same light a Stanley plate would require no more than twelve seconds, and eclipse plates of Carbutt no more than fifteen seconds. I mention this to show how easy it would be to overexpose either of these extremely sensitive plates, when using a developer which would give a fully exposed negative on a Carbutt plate ten times as slow.

With these very sensitive plates a very small stop should be used, with moderate rapidity of shutter. No more than $\frac{1}{4}$ -inch opening should be used.

In coming to conclusions about matters or questions such as are involved here there is no excuse for being in haste.

In closing, I would suggest that you do not bring in your verdict on the question of the value of eikonogen as a developing agent until one year from this date, or until our December meeting, 1890.

Mr. Charles Wager Hull has tried it against pyrogallic acid, so also has Mr. P. C. Duchochoy, with nearly the same results as in my experiments.

At the close of Mr. Newton's remarks he called for the experience of any present who had used eikonogen.

Mr. Joseph R. Husson said: "I have found, in experimenting with this new developer, eikonogen, much to corroborate Mr. Newton's statements."

And Mr. Newton added: "I might give the names of several distinguished photographers who have had a similar experience to my own in the use of eikonogen."

The *President* then introduced Professor Spaulding, who exhibited a portion of his views of Scotland, and, by special request of the section, consented to exhibit the remaining portion at the regular meeting, January 7, 1890.

Several views of Melrose Abbey were first thrown upon the screen. This Abbey is unsurpassed for grace and symmetry, and is the finest ruin in Scotland. In Edinburgh appeared first three of the most conspicuous points in the city, viz.: The Castle, Carlton Hill, and Scott's Monument.

The famous Highland Brigade was also seen on parade on the "Meadows." The John Knox house and other interesting buildings in the oldest portion of the city, in the vicinity of the Cannongate, were shown.

The scene then changed to Strome Ferry, a landing on the north-west coast of Scotland, whence a tiny mail steamer runs to Storno-

way, in the island of Lewis, the largest of the Outer Hebrides. The wharf, hotel, post office, and police station were seen nestled together under the cliffs of this wild, rocky fiord, that bears a close resemblance to Norwegian scenery. A good specimen of the Highland cow was exhibited, with her long and shaggy coat of hair.

Two or three views of Stornoway, the largest village in the Outer Hebrides, and of Lewis Park, were shown, when the entertainment was brought to a close.

A unanimous vote of thanks was tendered to Professor Spaulding, and the section then adjourned.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

At a special meeting called for the purpose, on November 21st, Mr. H. S. Bellsmith, of the Eastman Company, appeared before the Association to describe the manufacture of the new film and the subsequent manipulations necessary to produce a negative.

As this was the third appearance of Mr. Bellsmith before the members he was given a right cordial greeting by a meeting fully as large as has ever assembled in the rooms of the society.

With his direct style, good voice, and easy manner, he closely held their attention while he described the events which led to the gradual development from the first film produced by the Company, which was on paper and had to be oiled, to the transparent film of today, which is ready for printing as soon as dry after development. The difficulties and objections to the disagreeable work of oiling were humorously spoken of, and now that they are upon the verge of the past Mr. B. confessed that there *was* an awful lot of work connected with stripping.

As the process of manufacture of the films used in the stripping process is known to the readers of magazines, the description given, though interesting, will not be here repeated. Some facts regarding the new film, however, are interesting.

At first it was thought impossible to make a celluloid support long enough for use in the roll holder. After the difficulties in the way had been overcome there was trouble in getting the celluloid thin enough, for when too thick it would not lay flat on the table of the roll holder. After this question had been solved it was found that the emulsion separated from its support, sometimes even before

reaching the developer—what is known as dry frill. This was caused by the celluloid not being sufficiently seasoned—the presence of camphor, which is largely used in all forms of celluloid, preventing the necessary adherence. Finally, this serious difficulty was overcome, and its removal allows the production of the most satisfactory substitute for glass yet discovered.

Having finished his description, Mr. Bellsmith had the lights turned down, and, with the aid of proper illumination, proceeded to develop some exposures. Six pieces of transparent film were soaked in water to make them lay flat and afterwards transferred, one at a time, to a diluted developing solution of eikonogen. They were kept in motion, examined frequently, and in a remarkably short time, about twenty minutes, scarcely longer than the time required to develop a plate, six good negatives were produced. To guard against their frilling, made possible by the heat of the hand tending to dissolve the substratum, they were passed through an alum bath before fixing. After the hypo they were washed in the usual manner and then soaked in a solution of glycerine and water to insure their laying quite flat. Before the final washing they were handed around among the members for examination and found to equal products on glass.

Judging by sample negatives and prints, the results are much finer than those obtained by the stripping process, aside from the fact that negatives are easier to make. The skies are perfectly even, without the slightest trace of grain or mottle.

After this successful demonstration Mr. Bellsmith exhibited a number of new cameras, also the first Kodak ever made. Upon this subject the older members, as seasoned veterans of the tripod, could not resist the temptation to "Josh" him upon the subject of "you press the button; we do the rest," but he ably retorted, and by the production of the most compact and complete detective or hand camera yet seen here changed their criticisms to admiration. First came the enlarged Kodak. No longer a Kodak, said the critics, for it contained a finder and a changeable focus. The size of the image, still circular in form, is about double that of the first Kodak. The size of the box is about that of the ordinary detective. Good as this camera is it cannot hold a candle to its companion, the folding hand or detective camera. The front of this box drops down and is held in place by two traces. A bellows with lens and shutter attached is drawn out to a registered mark and

fastened by the turn of a lever. The shutter is set, the exposure made and the box closed up all in a moment. Equipped with a roll holder carrying transparent films sufficient for forty-eight exposures, this camera is complete and must become a favorite, particularly if it is furnished with a ground glass, as some of the members suggested. Upon the five by seven an ingenious arrangement of the rising front permits more sky to be obtained when used either horizontally or vertically, and the finder also changes to suit the shape to be made. Another recommendation is their small cost, fifty and sixty dollars respectively, which places them within the reach of many amateurs.

At the next regular meeting of the Association Mr. Bellsmith is to be the guest of the evening for the "tomale orgie" which follows. It would take too long to describe what this term means. It is sufficient to say that it is an occasion when there is plenty to eat and plenty to drink, with a sufficient number of good fellows to sharpen one's wits and make

"Good digestion wait on appetite,
And health on both."

A. J. TREAT,
Corresponding Secretary.

Bibliography.

PHOTOGRAPHISCHER ALMANACH UND KALENDER FÜR 1890. Düsseldorf: Ed. Liesegang.

This is the first of the foreign annuals to come to hand this year. As usual, it is full of interesting articles, and although of smaller size than those of England and America, it contains many desirable features, among others a number of practical formulas and tables. The illustrations are "Am Flensburger Hafen," a process print on the Miesbach principle; an illustration showing one of the new automaton photographic machines constructed by E. Enjelbert, and used in the Paris Exhibition; and two instantaneous landscape views with figures; also process prints.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1890.

As usual this well-known English annual comes to hand loaded with photographic lore, collected by our good friend, J. Traill Taylor. There are about 360 pages of reading matter, including articles from the best practical, professional and amateur photographers in England, formulas, tables, and lists of societies. It is impossible for us to give any

adequate idea of the value of this volume. We can only say, get a copy, you will most assuredly find it useful. There are three illustrations in this year's issue, one a bro-mide print and two process plates; all are good and worthy of study.

PHOTOGRAPHIC MOSAICS FOR 1890. By Dr. Edward L. Wilson. New York.

The volume for the coming year is the twenty-sixth issue of this always interesting little collection of photographic facts and practical ideas. The opening article is a very able review of the year's progress by the editor, and is one of the best pieces of work of this kind we have seen for some years—terse and yet full of the good things that have marked the advances of the past twelve months. Then follow articles by such writers as C. Piazz-Smyth, J. M. Appleton, C. G. Mitchell, W. T. Wilkinson, Gustine L. Hurd, E. K. Hough, Charles Ehrmann, Leon Vidal, Wilfrid A. French, C. H. Bothamley, E. Long and a host of others—practical men and who write to a purpose, that the reader may understand. The volume also contains six excellent full-page photomechanical prints. The old friends of Mosaics should not miss this volume, and those who do not know its value will do well to obtain a copy; they will not be disappointed.

THE AMERICAN ANNUAL OF PHOTOGRAPHY for 1890 is before us. Like its predecessors, it is well illustrated and well printed. It contains about one hundred and fifteen articles, by some of the best known writers in the United States, which cover about two hundred and twenty of its pages. In addition to these there are the usual tables of societies, calendar formulas, etc. The illustrations, although more numerous than in last year's volume, are not of as high a character.

TRAITÉ ENCYCLOPÉDIQUE DE PHOTOGRAPHIE, PAR M. C. FABRE. Paris: Gauthier-Villars.

This handsome production of the French house of Gauthier-Villars et fils, continues to come to our table regularly. The first volume of over five hundred large octavo pages is just complete, and the first section of the second volume is also to hand. The work will be finished in four volumes, and there is no doubt that the ground covered will make the work indispensable to every progressive photographer who can read French. To remind our readers that Gauthier-Villars are the publishers is enough to satisfy them that the work is handsomely presented.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. A. H. writes: Will you kindly inform me through the BULLETIN, whether I can use a rectographic portrait and view lens ($6\frac{1}{2} \times 8\frac{1}{4}$) as the objective lens for a magic lantern, and if so, whether the use of it as such will be injurious to it as a portrait lens.

A.—The lens you mention is admirably suited to the purpose, as is any good portrait lens. We have used just such lenses for years upon our lanterns, and cannot see that they have changed in any manner whatever. Of course if they were to become greatly overheated, some injury might result, not otherwise.

Q.—D. W. B. writes: I wish to learn something about the use of the flash-light with the camera for the purpose of preparing an illustrated lecture on mission work. Can you tell me where to obtain the information?

A.—Obtain the last edition (Third) of "How to make Photographs," issued by our publishers and read pages 100-102.

Q.—C. A. B. writes: Please answer the following in the columns of the BULLETIN. I sometimes use camphor to clear my silver bath of albumen, but by mistake added about an ounce of a saturated solution of bichloride of mercury to the bath of about 80 ounces. When I discovered what I had done I began to study what the effect would be, and came to this conclusion—*i. e.*, that it would precipitate the albumen (which I wanted) and also some of the silver. Was I right in my conclusion? I floated my paper as usual and never had paper to work better. If I am right, why would not mercury be a good agent for clearing the bath of impurities?

A.—We have never tried any experiments of the nature of your accident. We should think that probably all the mercury chloride was used up in precipitating the albumen, and therefore it did not affect the bath. An ounce of saturated solution of corrosive sublimate would only contain about 25 grains of the salt, and if your bath was badly contaminated with albumen it contained many times this amount.

Q.—L. H. S. writes: I want to make some tintype locket pictures, etc., and have an old collodion (Anthony's new negative) that works harsh, high lights very intense, with no detail in the shadows. Could you give a formula that would produce fine detail, with flat high lights? I could mix such a collodion with the old, and would I not then have a good ferrotype collodion?

A.—Try half a pound bottle of Anthony's positive collodion, and have your silver bath 35 to 40 grains strong and slightly acid with chemically pure nitric acid. Instead of the above collodion you may add to your old stock $1\frac{1}{2}$ grains of bromide of cadmium, dissolved in a little alcohol and ether, to every ounce of the stock.

Views Caught with the Drop Shutter.

Mr. EDSALL, at 246-248 West 125th street, New York, has just completed building a large addition to his former gallery, in the construction of which he has embraced all the latest practical improvements necessary to form one of the most complete and modern photographic establishments in the city. He has a double sky light room, covering an area of 25 x 50 feet, which is particularly adapted for making large groups, and when desired, each light can be used separately, at the same time enabling him to make nearly double the number of sittings usually made under a single light. Another great advantage to be derived from a double light is quicker work, so that patrons are not annoyed by long and tedious

waiting when sittings are desired, and particularly when children are the subjects.

The reception rooms are filled with fine specimens of portraiture, among which many faces may be seen which are familiar to the residents of Harlem. An hour can be pleasantly spent at any time by visiting the studios. Mr. Edsall is continually capturing new laurels, the result of his artistic advancement and enterprise.

WE copy the following sad intelligence from the Lock Haven, Pa., *Evening Express* of December 14th:

"Mrs. Emma Floyd, wife of J. W. C. Floyd, the well-known photographer, died early this morning at the residence of her parents on Water street, aged twenty-five years, nine months and two days. The circumstances connected with Mrs. Floyd's death are peculiarly sad, and create the deepest sympathy among the friends and acquaintances of her sorrowing relatives. Mrs. Floyd's father is lying a corpse in the same house, father and daughter resting side by side cold in the embrace of death. Another member of the family is ill, and their's is truly a house of sorrow and affliction to-day. The funeral services over the remains of Mrs. Floyd and her father, John N. Gast, will be held on Monday forenoon at 11.30, in Trinity M. E. Church, the funeral of Mr. Gast having been postponed to that hour. Mrs. Floyd was a lady of amiable disposition and loveliness of character, and her death will be regretted by a large circle of friends and acquaintances." We extend to the bereaved husband and family our sincere sympathy for them in their great sorrow.

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